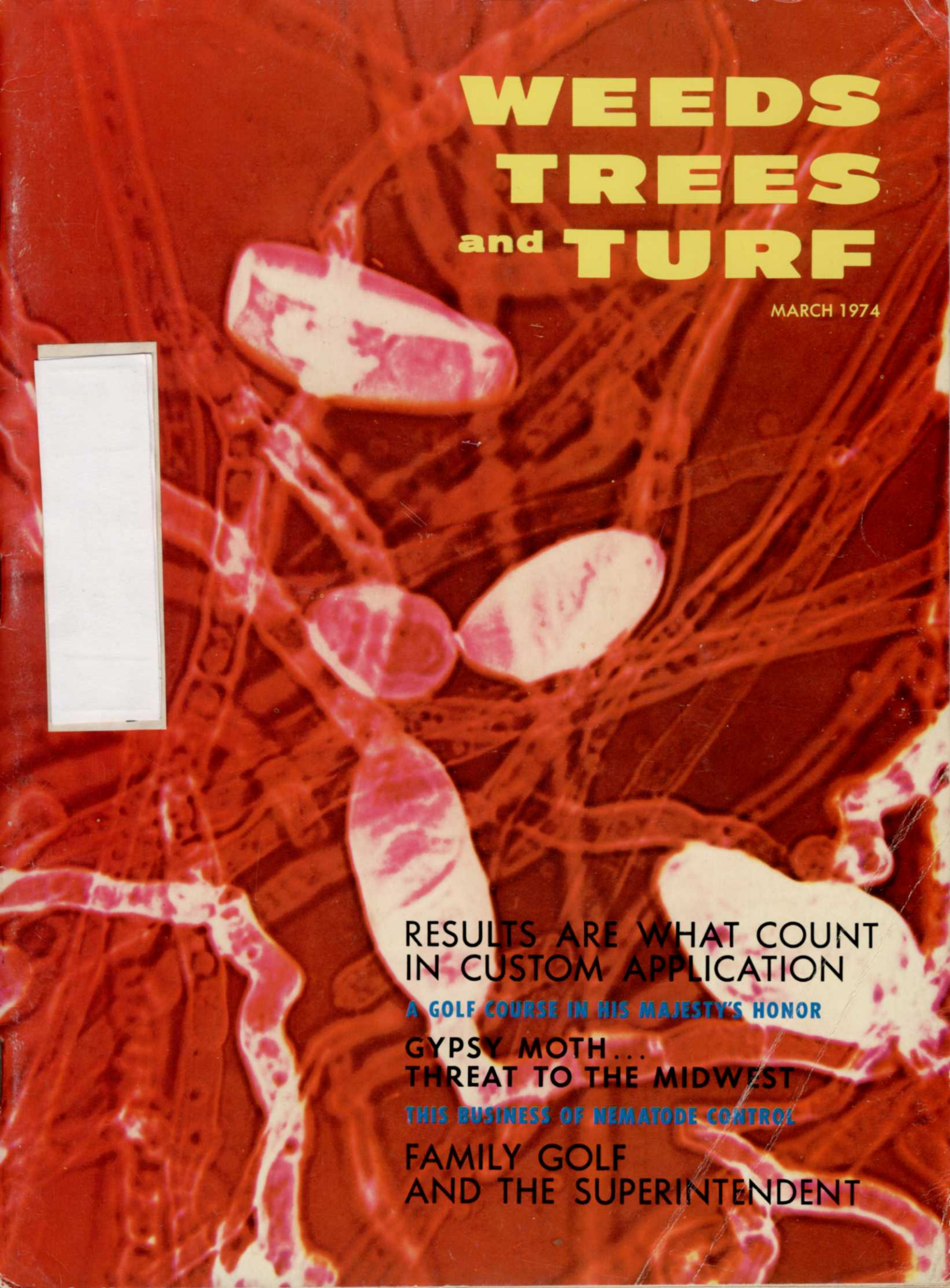
WEEDS TREES and TURF

MARCH 1974



RESULTS ARE WHAT COUNT IN CUSTOM APPLICATION

A GOLF COURSE IN HIS MAJESTY'S HONOR

GYPSY MOTH... THREAT TO THE MIDWEST

THIS BUSINESS OF NEMATODE CONTROL

FAMILY GOLF AND THE SUPERINTENDENT

"THE RIGHT APPROACH" TO GOOD TURF
CHIPCO TURF HERBICIDE MCPP
CHIPCO TURF HERBICIDE MCPP
NET CONTENTS 5 GALLONS
CAUTION: Keep Out of Reach of Children
"THE RIGHT APPROACH" TO GOOD TURF
CHIPCO TURF HERBICIDE "D"
CHIPCO TURF HERBICIDE "D"
For control of broadleaf weeds in turf, including golf courses, park grounds, and other non-crop turf areas.
NET CONTENTS 5 GALLONS
CAUTION: Keep Out of Reach of Children
CHIPCO THIRAM 75
CHIPCO THIRAM 75
TURF FUNGICIDE
CAUTION:
"THE RIGHT APPROACH" TO GOOD TURF
CHIPCO BUCTRIL
CHIPCO BUCTRIL
For the Control of Certain Broadleaf Weeds in Newly Planted Grasses for Sod or Seed Production
NET CONTENTS 5 GALLONS
CAUTION: Keep Out of Reach of Children
Do NOT Store with Foodstuffs
DO NOT USE, POUR, SPILL OR STORE NEAR HEAT OR OPEN FLAME
"THE RIGHT APPROACH" TO GOOD TURF
CHIPCO TURF KLEEN
CHIPCO TURF KLEEN
For control of many broadleaf weeds on golf
lawns, and similar recreational and ornamental
CAUTION: Keep Out of Reach of Ch
Do NOT Store with Foodstuffs
CHIPCO SPOT KLEEN
CHIPCO SPOT KLEEN
CHIPCO SPREADER-ACTIVATOR
CHIPCO SPREADER-ACTIVATOR
FOR TURF and ORNAMENTAL SPRAYS
CAUTION:
"THE RIGHT APPROACH" TO GOOD TURF
CHIPCO MICROGREEN LIQUID
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A blend of metal organo complexes of iron, zinc, manganese, and copper for the correction of turf nutritional deficiencies
NET CONTENTS 5 GALLONS
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Buy a Chipco® something, get a Chipco® something else absolutely free.

Why are we doing this?

To help you save money. But, we have something else in mind, too.

Chipco is the best group of products you can use for an effective turf management program.

And we know once you use Chipco anything, you'll soon be using Chipco everything else.

If you buy:	You get free:	If you buy:	You get free:
24 lbs. Chipco Spot Kleen	1 gal. Chipco Turf Herb. MCPP ($ 9.85 value) Or 6 lbs. Chipco Thiram 75 ($ 6.84 value) Or 1 gal. Chipco Spread Act. ($ 6.70 value)	30 gal. Chipco Turf Herb. MCPP	1 gal. Chipco Buctril ($18.54 value) Or 3 gal. Chipco Turf Herb. D ($13.62 value) Or 15 lbs. Chipco Thiram 75 ($17.10 value)
10 gal. Chipco Buctril	6 lbs. Chipco Thiram 75 ($6.84 value) Or 1 gal. Chipo Turf Herbicide MCPP ($9.85 value) Or 1 gal. Chipco Turf Kleen ($7.52 value)	15 gal. Chipco Turf Kleen	1 gal. Chipco Spread Act. ($6.70 value) Or 1 gal. Chipco Turf Herb. MCPP ($9.85 value) Or 6 lbs. Chipco Thiram 75 ($6.84 value)
		10 gal. Chipco Microgreen Liquid	1 gal. Chipco Turf Kleen ($7.52 value) Or 1 gal. Chipco Spread Act. ($6.70 value) Or 1 gal. Chipco Turf Herb. MCPP ($9.85 value)

Chipco Buctril® controls broadleaf weeds in newly planted grasses for sod or seed production.

Chipco Turf Herbicide MCPP controls clover, chickweed, knotweed and other surface creeping weeds and is safe and effective for use on most bent grasses.

Chipco Turf Kleen controls broadleaf and surface creeping weeds with a wider margin of safety around trees and shrubs.

Chipco Spot Kleen is a new systemic fungicide for control of dollar spot, Fusarium blight, large brown patch, copper spot, and stripe smut.

Chipco Thiram 75 prevents and controls large brown patch, dollar spot and snow mold.

Chipco Microgreen Liquid provides long lasting deep green color, more root growth and less desiccation.

Chipco Turf Herbicide D is a general purpose broadleaf herbicide ideally suited where economical control is desired.

Chipco Spreader Activator is a superior adjuvant to increase the efficiency and effectiveness of turf chemicals.

Rhodia
CHIPMAN DIVISION

Note: offer expires April 1, 1974.

Chipman Division of Rhodia, Inc., 120 Jersey Avenue, New Brunswick, N.J. 08903

For More Details Circle (179) on Reply Card

We'll put our weed control crew

up against yours any day!

Would your crew promise (and deliver!) effective control of many weeds for as little as ten cents per thousand square feet?

Would they promise not to damage or weaken any growing stock they are cleared to handle?

Would they keep on working around the clock, month after month?

If not, turn the weed control job over to our crew. You couldn't ask for better, more dependable help!

Elanco Products Company, a division of Eli Lilly and Company, Dept. E-455, Indianapolis, Indiana 46206, U.S.A.

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(Treflan®—trifluralin, Elanco)
(Dymid®—diphenamid, Elanco)

WEEDS TREES and TURF®

"Serving The Green Industry"

Volume 13, No. 3 March, 1974

Probing The Unseen 10

Gypsy Moth, Threat To The Midwest 16

The devestation caused by the voracious gypsy moth in the northeast could well be repeated in the midwest. Here is how to control this pest; plus, the experiences of those who have already battled the insect.

Sales Up For Ohio Custom Applicator 18

Forrest Lytle started in the custom application business thirty years ago. His knowledge and experience have made him a business that competes favorably with the top custom applicators in the field. His secret to success is relayed in this story.

Southern Weed Science Society Report 20

A Golf Course In His Majesty's Honor 22

Located 15 minutes from Philadelphia, King's Grant Country Club was developed on ground one time granted to colonists in the 17th century. Today, this area is a golf course and housing project that honors King James II of England. Read how the irrigation system was installed.

Simplified Nematode Control For Golf Greens 24

Soil insects and nematodes can play havoc with greens, tees and fairways. Jack Russell, owner of Soil Fumigants, Inc. has developed a way of controlling these pests. His low cost method may well have application on courses in the northeast and midwest.

Turf Contaminants 76

No one wants to buy seed that has contaminants. It increases the value of the pure seed and prevents a perfect turf stand. Dale E. Kern, Seed Technology, reports on the work being done to rid contaminants from turfgrass seed.

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The Cover

Photomicrographs are used by scientists to probe the unseen. Our cover this month takes the reader into the unknown. This is an extreme exposure to a turfgrass disease that plagues almost every superintendent and maintenance man in the business. For details on this unusual picture, see our cover story "Probing The Unseen" on page 10.

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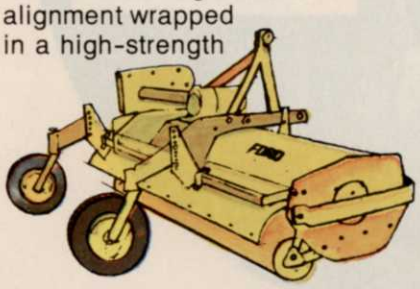
Strength that cuts it: Ford Flail Mowers.

Ford flail mowers, inside and out, are built to handle tough, punishing work! Drive-line features heavy-duty components like banded V-section belt drives . . . high-capacity bearings . . . rugged gearbox. Welded frame braced by full-width torque tube maintains gear and drive alignment wrapped in a high-strength

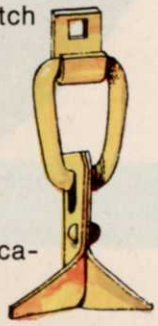


sheet steel housing. Available with optional rear bumper, right-end bumper guard, gauge wheels, and steel or rubber gauge rollers. Ford flails are built to take it! And servicing is easy.

Blade hanger lets you remove one blade at a time. Bolt-on design makes blade removal and reattachment fast and easy.

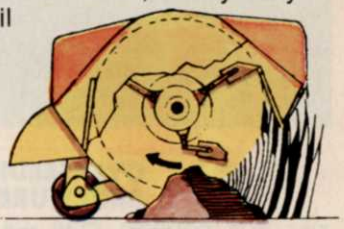
Improved flail-safe design. Protective configuration of the heavy steel rear shield is designed to prevent straight-line ejection of material from under the mower housing, regardless of cutting height.

Three cutting widths. 62-inch, 74-inch, and 88-inch models are available to match your tractor power and mowing needs. All offset for ease of mowing close to trees and other obstacles.



Widen the range of flail mower applications. Rugged Ford flails improve mowing results even in some areas where you are now using rotary cutters and cutterbars.

See the versatile, heavy-duty Ford flail mower line at



your Ford tractor and equipment dealer. He is listed in the Yellow Pages under "Tractor Dealers" or "Contractors' Equipment & Supplies". See him for information on how to buy, lease, rent, finance.

NUMBER ONE ON WHEELS AND GROWING

FORD TRACTOR

Ford

Rollover bar, tractor 3-point hitch, high-flotation tractor tires illustrated are optional at extra cost.

For More Details Circle (124) on Reply Card

Editorial

Let's Put The Railroads To Work

Decline in rail transportation of goods may soon take a swing in the opposite direction, if Federal Highway Administrator Norbert T. Tiemann has his way.

Speaking out in what amounts to the first positive stand for sensible movement of goods over long distances, he predicts that pressures of growth and shortages of energy will dictate greater use of railroads in the future. Pressures for increasing the current size and weight limits on motor carriers, pressures to develop separate rights-of-ways for passenger and freight vehicles, pressures to develop other modes of freight transportation—all these and others are causing the present Administration to once again turn to America's most economical transportation system.

Why the delay? Box cars (freight units) coupled end to end and pulled by a single power source represent rolling economies in fuel, space and efficiency. For long distance terrestrial hauling, railroads have always been the most economical mode.

Yet, during our lifetime, changes in technology have nurtured the maturity of transportation systems such as airplanes, pipelines, autos and trucks. Industry's race to develop, build, compete, expand and profit has perpetuated the long-haul-by-truck-to-save-time concept.

So when railroads began slipping off their mighty throne, multi-wheeled leviathans lumbered onto highways built originally for passenger traffic and skimmed the gravey off the long haul, high ticket value items. The result is that in 1972, combinations of trailer and semi-trailer vehicles totaling 990,000 traveled almost 47 billion miles and consumed over 8.5 billion gallons of fuel.

In short, we now have paid dearly to buy those few hours of precious time.

Administrator Tiemann now has proposed that we develop a long-range solution. He suggests shifting freight from roads to rails in a coordinated system of freight transportation. To carry his idea ahead motor carriers would perform pick-up and delivery services, and short-haul intercity movements. Intermodal terminals could be jointly operated. Railroads would handle the line-haul portion of long distance movements. Thus ". . . railroads become the wholesalers of transportation . . . while motor carriers would become, in effect, retailers of transportation," he says.

The Green Industry stands to gain from this directly. Greater use of railroads will necessitate more and better maintenance of rights-of-ways. The possibility of separate highways for motor carriers moving freight short distances creates more miles to be patrolled in vegetation care. Terminals will mean bareground weed control to reduce the chance of fire, etc. Landscaping will be needed. Tree and ornamental care possibilities emerge.

American railroads. Who needs them? We all need them.

WHY IS OREGON CALLED THE FAIRWAY GRASS ?

FINE FESCUE

Both Chewings and Red Fescue withstand dry conditions, are tolerant to shade, and low fertilization levels. Both grow erect to hold the ball up better than most grasses. Great for overseeding.

FREE OVERSEEDING BROCHURE

FILL OUT COUPON, CLIP and MAIL TO:

OREGON CHEWINGS AND CREEPING RED FESCUE COMMISSION
1349 Capitol N.E., Salem, Oregon 97303

Name .....

Address .....

State ..... Zip .....

OREGON CHEWINGS AND CREEPING RED FESCUE COMMISSION
1349 CAPITOL ST. N.E. SALEM, OREGON 97303

APPLY MALLINCKRODT

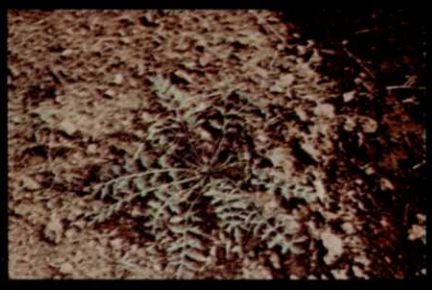
TREX-SAN™

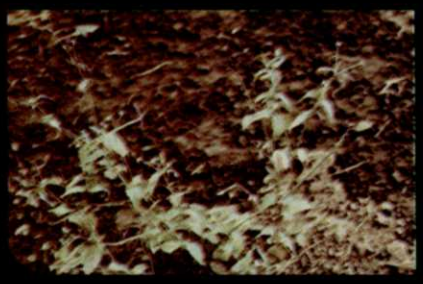
Brand Broad-Spectrum SYSTEMIC Broadleaf Herbicide

ONCE-

RID YOUR TURF OF...

and more than 35 Other Broadleaf Weeds





MOST EFFECTIVE SAFE HERBICIDE

One early application of Broad-Spectrum TREX-SAN™ will kill the weeds that plague you now, thus also preventing their seeding and re-appearance next year. TREX-SAN combines the unique weed-killing properties of 2,4-D, MCPP and DICAMBA — their synergistic action in TREX-SAN provides the safest, most effective single herbicide known. We've seldom found a broadleaf weed TREX-SAN won't control. Yet it provides an extra tolerance of safety to fine turf and ornamental plantings when applied as directed. A single gallon of TREX-SAN treats *four full acres* to save you *money* . . . Single applications in spring and fall save you *time* . . . in achieving complete weed control. Order TREX-SAN from your Mallinckrodt distributor today.

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ST. LOUIS

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For More Details Circle (123) on Reply Card

THE COVER

Probing The Unseen

Feeling like Gulliver in this Lilliputian world known only to mortals with microscopes, we must stare with awe at the marvels of nature. What you see on this page and also on the cover of this issue represents man's ability to penetrate the unseen.

These are spores and mycelium of *Helminthosporium sativum*. They were trapped in this photomicrograph taken by Dr. Houston B. Couch, professor and head of the department of plant pathology and physiology, Virginia Tech. Technically this disease of turf is also known as *Helminthosporium sorokinianum*. But commercial turfgrass managers know it better as leafspot.

This particular strain is perhaps the most destructive of the many Helminth strains. It most commonly affects Kentucky bluegrass, annual bluegrass, creeping bentgrass and creeping red fescues. It should not be confused with melting out, a characteristic identified by *Helminthosporium vagans*. Rather, leafspot actually blights the lamina (extended parts of the leaf). This causes a sudden collapse and drying of the leaf blade, after which the leaves blanch to a light straw color.

How fast does this occur. The photo you see here contains only a few isolated spores. In turf, millions of those spores can germinate within a very short time. During warm, humid weather, leaf blighting may occur with four or five days from the time of initial infection. It's been reported that leafspot is temperature related. The higher the temperature the greater the damage resulting from the disease.

Leafspot survives the winter as dormant mycelium (the chainlike structures in the photo) in infected plants and infested debris such as thatch. It initially develops on this dead tissue, but can just as easily develop on dead tissue of growing plants. According to Dr. Couch, on Kentucky bluegrass leaves, spores germinate in 30 to 40 minutes from the onset of optimum environmental conditions.

Carbohydrate levels as a factor of plant nutrition are not of importance in determining the proneness of Kentucky bluegrass to Helminthosporium leafspot. Tests have shown that the susceptibility of Kentucky bluegrass to leafspot increases with increasing rates of nitrogen fertilization.

How can you control leafspot? Cultural practices including fertilization and mowing should be practiced. Seed varieties exhibiting some resistance to leafspot have been developed; more will be coming. Fungicides are available to effectively control the spread of the disease. Among the many are: Dyrene, Daconil, Thiram, Zineb, Tersan LSR, Acti-Dione, and others.

Disease Control Planning Is Needed

On many golf courses disease control was a relatively simple business until irrigated fairways and the new systemic fungicides came along. Since then life has become more complicated every year.

In the good old days of dry fairways, drought damage overshadowed disease problems, thus, the greens and sometimes tees were a superintendent's only worry.

Irrigated fairways created 30-40 acres of potential "sick grass." A single fungicide application to fairways may involve an investment from $500 to as high as $6,000.

The older metallic fungicides such as the mercury to cadmium materials and even organic protectants such as

(continued on page 56)

For More Details On Following Page Circle (102) On Reply Card

Our Parkmaster mows swaths from 30 in. to 18½ ft. wide at the touch of a finger.

Or buy the turf tractor alone.

Your choice of 5, 7 or 9 cutting units — hydraulically raised and lowered in any sequence, individually and in groups. That's how the Parkmaster gives you a mowing tractor that can cover up to 80 acres of turf in an 8 hour day. It combines flexibility with high capacity, and comes complete with features found in no other mowing tractor of its kind.

The Parkmaster is built around the Toro Turf Tractor — the first turf tractor with an optional ROPS safety package that's certified to meet OSHA regulations. And you can buy the tractor with gas or diesel power, too.

Look over the features and benefits of these classic Toro machines in detail on the next page.

PARKMASTER®
AND TURF TRACTOR

TORO®

TORO®

PARKMASTER®
AND TURF TRACTOR

*Specifications and design subject to change without notice. The Toro Company, Bloomington, Minnesota. Printed in U.S.A.

What do the features of our Parkmaster and Turf Tractor mean to you?

THE PARKMASTER TRACTOR

All 5, 7 or 9 cutting units are hydraulically lowered for mowing or raised for transport in seconds to give you more time mowing, greater area coverage. All cutting units are mounted to the hydraulic frame to allow maximum movement in following turf undulations — thus maintaining higher quality of cut. Front wheel steering and balanced weight distribution front to rear (engine in front, cutting units toward rear) results in superior handling and traction. The flexibility and mobility of the Parkmaster gives you a high-capacity mowing machine with maximum energy-saving capability — fewer passes to get the job done. And the Parkmaster takes the Spartan mowers with single-point, center-control, quick and easy bedknife-to-reel adjustment (U.S. Pat. No. 3680293) for more efficient cutting.

SPECIFICATIONS*

PARKMASTER 5 — Gas Engine — Model 33755
PARKMASTER 7 — Gas Engine — Model 33787
PARKMASTER 7 — Diesel Engine — Model 33677
PARKMASTER 9 — Gas Engine — Model 33876
PARKMASTER 9 — Diesel Engine — Model 33699

PARKMASTER HYDRAULIC FRAMES

Cutting Units: 5, 7 or 9.
Width of Cut: 5 unit — 11′; 7 unit — 14′6″; 9 unit — 18′6″.
Hydraulic Lift for Raising and Lowering All Cutting Units: 1st, 2nd and 3rd cutting units operate together. Cutting units 4 through 9 operate individually, depending on frame.
Main Frame: Tubular and structural steel, bolted and electrically welded construction.
Wing Lift Arms: Tubular steel, reinforced welded construction.
Hydraulic System: Reservoir: 7 Quart capacity with screw-on easily replaceable 40 micron filter. Full flow filter includes by-pass valve with 11-18 P.S.I. pressure setting. Control Valves: Heavy duty, directional control valves, parallel circuit, stack design. Cast iron valve bodies, with hardened spools and plated for corrosion protection. Primary relief valve, non-adjustable. Relief valve prevents excess pressure build-up in the hydraulic system and safeguards the hydraulic pump and hoses. Hydraulic Cylinders: Tie rod construction, 3 inch bore, double-acting cylinders; chrome-plated rods 1⅛ inch diameter. Precision finished bore in cylinder tubes. Gas model pump: gear type, 10 G.P.M. @ 1700 R.P.M., 1500 P.S.I. maximum, belt driven from engine crankshaft with matched set of two belts. Diesel model pump: Vane type, 10.5 G.P.M. @ 1200 R.P.M., 1500 P.S.I. maximum, pump shaft coupled directly to front engine crankshaft pulley.
Hoses: Two braid hoses with swaged fittings.
Cutting Units: Spartan or Roughmaster mowers. Note — Spartan mower only on 9 unit version.

THE TURF TRACTOR

GAS ENGINE MODEL 37027

Designed specifically for turf use — for maximum utility, maximum pulling power and minimum turf damage. Ruggedly built from the larger engines, to synchronized transmission, to the husky rear axle. Low center of gravity and long wheelbase for greater stability, combined with short turning radius for excellent maneuverability and superior performance. Your choice of engines — a 250 CID GM 6-cylinder gasoline industrial, or a 236.4 CID 4-cylinder Perkins diesel (for Parkmaster only) to give you the power plant that's right for your needs. Operator area is engineered for ease and safety; automotive controls are conveniently located, shift stick is in familiar, comfortable position, to reduce training time and help increase speed of handling. Power steering is standard on all models for less effort, smoother control. Four-speed synchronized transmission for easy downshifting. Separate gas tank for balance, and safety when filling. New options are the Roll-Over-Protection System (ROPS) and the cab with ROPS — both certified to meet OSHA specifications.

SPECIFICATIONS*

PARKMASTER (POWER UNIT) AND TURF TRACTOR

Engine: Gasoline — Chevrolet, 6-cylinder — 250 CID 8.5:1 compression ratio. Crankshaft and connecting rods — drop forged steel, heat treated. Oiling system — full pressure 20-30 lbs. per sq. inch driven by gear type pump. Oil capacity — 5 qts. in crankcase plus 1 qt. in the oil filter. Oil filter — replaceable element. Air cleaner — dry element. Horsepower: 107 BHP at 2400 R.P.M.
Diesel — Perkins, 4-cylinder overhead valve, direct injection; 236.4 CID — 16:1 compression ratio. Crankshaft and connecting rods — drop forged, heat treated. Full pressure oil lubrication system, replaceable element oil filter. Dry type air cleaner with replaceable cartridge. Horsepower: 78 BHP at 2500 R.P.M.
Power Steering: Standard equipment, Saginaw rack and pinion automotive steering gear ratio 17.5:1.
Throttle Control: Gas and diesel has foot pedal — with manual choke control. Diesel model has variable speed governor and hand throttle standard equipment.
Seat: Contour seat with wrap-around 13″ high back rest. Finger tip fore and aft adjustment. Seat pad and backrest are foam filled with integral vinyl cover.
Cooling System: Radiator with tube and fin construction. Stamped brass top and bottom tanks. 15 P.S.I. pressure cap. 16 qt. capacity.
Fuel Capacity: 15½ gallon tank rear-mounted on tractor chassis.
Instrument Panel. Consists of ammeter, fuel, oil pressure, and engine temperature gauges, speedometer, manual choke, ignition switch. Diesel tractor also has manual fuel shut-off for engine shut down.
Battery: Gasoline model — 12 volt, 54 plate, 45 amp capacity. Diesel model — two 6-volt, heavy-duty batteries wired to provide 12 volt service.
Tires: Rear: High flotation tires for minimum compaction. Dual all-traction 7:50x16 — 4 Ply with tubes and air/water valve. (9 unit Parkmaster has special 8.00x16 6 Ply lawn and garden tread turf tires.) Front: Standard on turf tractor, 5 and 7 unit, are drop center 15x5 wheels with 6.70x15 4 Ply — ribbed tires and tubes. Standard on 9 unit are drop center 14x8 wheels with 9.50x14, 4 Ply, ribbed tires and tubes.
Brakes: Bendix 13 inch by 2½ inch wide, double servo self-adjusting hydraulic brakes on rear wheels, providing 133 sq. inches total brake shoe area. Wagner master cylinder. Parking brakes by mechanical actuation on rear brake shoes.

SPEED (MPH) IN WORKING GEARS

	1200 rpm	1600 rpm	2000 rpm
4th gear	14.69	19.58	24.48
3rd	8.83	11.78	14.73
2nd	4.40	5.87	7.33
1st	2.28	2.93	3.66
Reverse	1.77	2.37	2.96

Optional Equipment: Front wheels and Tires — 9.50x14 (Model 70180). Dump box (Model 70043). Cab with ROPS (Model 70138). ROPS (Model 70137). Road package (Model 70096) — horn, directional signal, headlights and taillights. Front fender (Model 70196). Governor Kit (Gas only) (Model 70106).

OVERALL DIMENSIONS (Parkmaster and Turf Tractor)

		Wheel Base	Length	Width Transport	Width Mowing	Height	Weight (2) Front	Weight (2) Rear	Tread Width Front	Tread Width Rear	Ground Clearance
Turf Tractor		99″	133″ (1)	84″	N/A	66″	1460	1540	61¼″	65½″	10″
Gas	5 Unit	99″	188″	96″	11′	66″			61¼″	65½″	10″
	7 Unit	99″	188″	96″	14′6″	66″	1580	4740	61¼″	65½″	10″
	9 Unit	99″	180″	96″	18′6″	91″	1220	6060	61¼″	65½″	10″
Diesel	7 Unit	99″	177″	96″	14′6″	66″	1840	4780	61¼″	65½″	10″
	9 Unit	99″	175″	96″	18′6″	91″	1220	6060	61¼″	65½″	10″

(1) Without dump box. 150″ with dump box.
(2) Includes oil, fuel, coolants and Spartan mowers in the transport position. Additional weight may be added using liquid ballast in the tires.

See turf tractor specifications for additional specifications and optional equipment.

Green Industry Book Report

Diseases Of Turfgrasses, by Dr. Houston B. Couch, Professor of Plant Pathology, Virginia Polytechnic Institute and State University.

The author, Dr. Houston B. Couch, has substantially updated the text of his first book in this popular second edition. Those who have the first printing will find the new book as refreshing and authoritative as the one in their collection. Those less fortunate now have an opportunity to purchase one of the best and most comprehensive texts in print today.

As a whole, Diseases Of Turfgrass is excellent. It is written in easy to understand yet specific style. A superintendent or grounds keeper knowing little about plant pathology would benefit from having this text in his personal library. In a deeper sense, however, the book is complete in detail to serve as a handy reference or text for the plant pathologist.

There are basically five chapters to the book. Organization is one of the keys to knowledge and the author has developed a system throughout this work which is easy to understand. Chapter one serves as introduction into the concept of plant disease, its causes and history.

Chapter two discusses diseases of turfgrass caused by pathogenic fungi. Chapter three lists diseases of turfgrass caused by pathogenic nematodes. Chapter four is a discussion of diseases caused by viruses and mycoplasma-like organisms. The last chapter should be read first, especially by those concerned with environmental protection chemicals. It is a highly interesting analysis of fundamentals of turfgrass disease control.

Convenience in organization is best shown in the way fungi, nematodes and viruses are presented. Sections are arranged in this order: 1. symptoms; 2. the pathogen 3. hosts; 4. disease cycle; 5. control. The reader can quickly locate any disease.

Another special feature of this text is the appendix tables which comprise roughly a third of the book. Cross-indexing of diseases according to grass species affected, common names, grass species susceptible to turfgrass pathogens by common name, and grass species susceptible to turfgrass pathogens by technical name provide a quick and easy reference.

Speaking of references, Dr. Couch has cited 364 literature references to help the reader understand more about a specific disease.

Diseases Of Turfgrasses is published by Robert K. Krieger Publishing Co., Huntington, New York. $17.50

Poison Treatment Chart Available

An excellent chart which quickly details the necessary actions in cases of acute pesticide poisonings is now available.

"Emergency Medical Treatment For Acute Pesticide Poisoning" lists for insecticides, rodenticides, herbicides and solvents, chemical basis, commercial products and generic names, pharmacologic action or site of toxicity, toxicity rating, symptoms, treatment, and laboratory tests. It is all contained in this 17-inch by 21-inch chart which can be mounted on a wall.

For a copy of the chart, write: Disease Vector Ecology And Control Center, United States Navy, U.S. Naval Air Station, Jacksonville, Florida 32212.

You'll find everything you need to know about tree movers in this folder from VERMEER...

Take "The Diggin' Dutchman's" Model 30 + 30 Tree Spade, for example. A great landscaping machine. Transplants trees, shrubs and bushes in minutes. With an all-hydraulic loader, backhoe-blade combination or dozer blade on the opposite end, it doubles, even triples job capacity. Easily converts to heavy-duty trencher when transplant season tapers off. Interested? Write for all the facts . . . and information on all 7 Vermeer models.

THE DIGGIN' DUTCHMAN
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For More Details Circle (138) on Reply Card

Government News / Business

The Occupational Safety and Health Administration (OSHA) is moving ahead on regulations that would affect agriculture and the Green Industry. Latest proposed rules would require guarding of farm field equipment and farmstead equipment. Not included are farm shop equipment or portable power tools. Most farm machinery is adequately guarded, anyway. OSHA would make it a law. This means that power take-off drives on all tractors and equipment must be guarded no later than April 1975. All other mechanical power transmission components must be guarded after Jan. 1, 1975; all equipment, regardless of manufacture date by Jan. 1, 1976. OSHA also proposes that operators be instructed in safe operation and servicing of all equipment.

What about seed supplies? Dr. Guy W. McKee, secretary of the Agricultural Experiment Station Seed Committee at Penn State University, says Pennstar Kentucky bluegrass and Pennfine perennial ryegrass is more available now than in previous years. Seed stocks seem to be good.

Acme Pesticide Division of Sherwin-Williams Company, Cleveland, Ohio, has been acquired by PBI-Gordon Corp. The line of Acme Lawn and Garden Products is considered to be one of the oldest leading pesticide lines. No disclosure was made as to the purchase price. The acquisition extends the Gordon operations to 49 states.

Public Comment is invited on a criteria document before OSHA on worker exposure to inorganic mercury. Specific views are needed on alternatives to recommendations, environmental impact, worker injury and illness experience with mercury, and estimated compliance costs.

Look soon for a ruling by the Environmental Protection Agency on the use of DDT for control of Tussock Moth. The last of the five public hearings was held in Washington D. C. in early February. At presstime, no ruling had been made yet.

71,441 billboards have met their demise, according to the Department of Transportation. Secretary Volpe, who heads the Outdoor Advertising Removal Program, hasn't been cooling his heels with the Highway Beautification Act of 1965. To date, 112,587 small political posters have been removed in addition to the billboards. Colorado leads the states in the removal program with 11,267, followed by South Dakota with 11,237; Georgia, 7,090; Wyoming, 3,444; and Montana, 3,327. Volpe said that with the help of the new "Sign Cost and Depreciation Schedules" developed recently, "we expect that the removal of unsightly billboards will be greatly accelerated in the future."

Velsicol Chemical Corporation is expanding its line of industrial vegetation control chemicals with the addition of the Vegatrol herbicide series. This line includes formulations of 2,4-D and 2,4,5-T amines and low volatile esters. The company continues to manufacture and market Banvel.

Sales forecast for Hahn, Inc., Evansville, Ind. is for a 25 percent increase in 1974. Last year's increase in sales was 28 percent. The company has just completed a quarter million dollar equipment modernization program. This will enable Hahn to step up production for all three divisions.

a name you can't forget

The first time a turf expert sees Fylking and he gently tests the turf, lifts a swatch and examines the root system, and closely scrutinizes the low-growing, 90-degree side angled leaves, please notice the subtle smile that crosses his face. This is the countenance of the wine connoisseur who has wet his lips with classic vintage, the man who recognizes the truly classic beauty of the Venus de Milo, the research agronomist who has spent years seeking the perfect turf and now views Fylking. Once he has, he wants to know more about this obviously elite Kentucky bluegrass. This man will appreciate knowing Fylking has received overall superior disease-resistance ratings from every major university and institution where tested for leaf spot, stripe smut, stem rust and leaf rust. When he examines the technical brochure he will smile again. Fylking is not perfect, but it's the closest of any. Fylking. It's a name you can't forget.

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FYLKING KENTUCKY BLUEGRASS
U.S. Plant Patent No. 2887

Another fine product of Jacklin Seed Company

If you would like our full color technical brochure No. 102 on 0217® Fylking Kentucky bluegrass, please ask your Fylking sod or seed distributor or write to Jacklin Seed Co., E. 8803 Sprague Ave., Spokane, WA 99213.

For More Details Circle (116) on Reply Card

Gypsy Moth Threat To The Midwest

TO THE TYPICAL homeowner in the Midwest, the gypsy moth is a strange and distant phenomenon, one that does not threaten the beauty of his own backyard.

The moth has begun to rate editorial space many miles from the devastated Northeast, however. The Oct. 6, 1973 Chicago *Tribune* presented an article titled "Gypsy moth a threat to nature in Illinois."

The story said that the first gypsy moth in Illinois was trapped this past summer in Palos Township in south Cook County by a ranger of the Cook County Forest Preserve District.

Stanley Rachesky, entomologist at the University of Illinois speculated that the gypsy moth (in egg stage) may have hitched a ride to the heartlands on a variety of vehicles.

A new pest for the future? "It may or may never become a problem in Illinois," Rachesky said. "It's just too early to tell."

In Michigan, the threat of gypsy moth infestation has officials worried even though damage was "slight" last year. But the threat was sufficient for Michigan State University's department of entomology to name gypsy moth the "Insect Pest of the Year." In 1973, some 13,000 acres in central Michigan — where the pest is most prominent — were sprayed. If the infestation spreads this year, results could be disasterous, officials warn.

Progressive Midwestern arborists and custom spray applicators will probably be turning more and more to biological control or larval pests like their counterparts in the Northeast.

The gypsy moth and other larval pests defoliated an estimated 1.7 million acres of northeastern woodland last year (up 30 percent from 1972), says the USDA, but arborists and municipal officials there were successful in combating the pests with *Bacillus thuringiensis* (Bt), trade-named Dipel.

"It worked quite well for us this year against the gypsy moth and other caterpillar pests," said George W. Gauer, director of purchasing for Lawn Doctor Inc., Wickatunk, N. J., the parent company of some 95 lawn servicing and tree spraying operations nationally. Lawn Doctor has 20 dealers in the northeast.

The northeastern dealers sprayed some 600,000 sq. ft. of ornamental trees and shrubs for gypsy moth. Dealer feedback was very favorable, Gauer said.

"Gypsy moth infestation ranged from a nuisance in some areas to a devastation in others," he reports. "Ocean County, New Jersey, a heavily forested new housing area, was among the latter. We were still able to bring the moth under control in Ocean County after two or three applications.

(continued on page 28)

What Is BT?

Bt is a natural bacterium, *Bacillus thuringiensis*. An improved Bt strain, trade named DIPEL is available as a wettable powder.

When gypsy moth or other caterpillars ingest foliage sprayed with Dipel, their digestive mechanism is disrupted and the pest immediately stops feeding. Death follows from within three hours to three days.

Unlike the organic chemical insecticides, this compound controls only Lepidopterous larvae — the group which includes worms such as: gypsy moths, tent caterpillars, and inchworm. It is not harmful to desirable insects, animals, fish, humans, or plants.

Larvae which have died are not dangerous, either. Tests have shown that birds and other predators readily eat and thrive on sprayed larvae.

Dipel can be applied by any means normally used to apply conventional insecticides. During the past three years, it has been applied by hydraulic and mist sprayers, garden-type tank sprayers, helicopters, fixed-wing aircraft and garden hose spraying attachments. Using correct techniques, all were equally effective. Thorough coverage is important as larvae must ingest the material to be effective

Cost is somewhat higher than other environmental protection chemicals. But safety and negligible environmental impact, however, make the small difference in cost seem insignificant.

Dipel is manufactured by Abbott Laboratories, North Chicago, Illinois. For more details, circle (723) on the reply card.

New Emerald variety produces the most uniform creeping bentgrass turf that can be seeded. No patchiness, no objectionable grain—because every seed traces back to a single outstanding parental plant.

Emerald's vigor crowds out weeds, including *Poa annua*, and self-heals divot wounds and cart tracks. Yet, there's less puffiness, less thatch—even less mowing required. It means added beauty and playing quality for the course, with less work and problems for you.

Now, there's a beautiful new golfing turf you'll find easier to manage...

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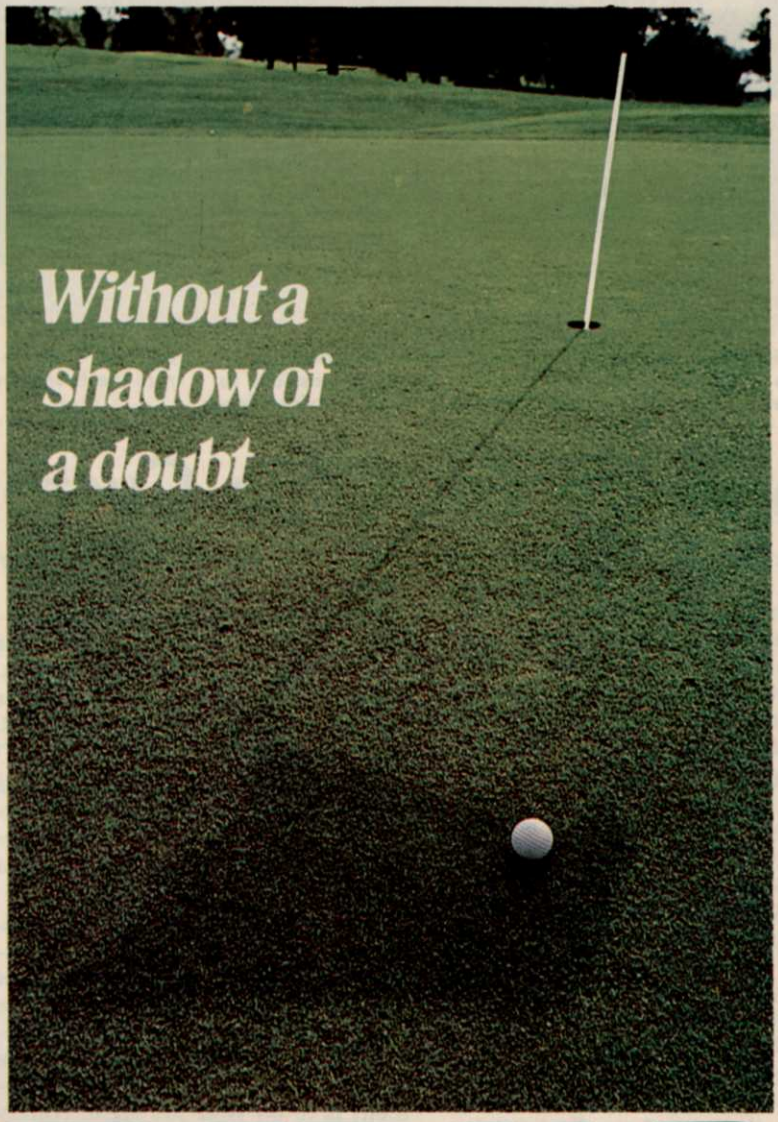

EMERALD
SMARAGD VARIETY
CREEPING BENTGRASS

For More Details Circle (153) on Reply Card

One of the trucks in this custom applicator's inventory is an Econoline pickup. It's size and mobility make it possible to easily get to the job and perform the needed service. Forrest Lytle's business volume has increased about 3000 percent from the first year of his operation.

Sales Up For Ohio Custom Applicator

"From the day we started out in business we've never been completely caught up," says Forrest Lytle, owner and operator of Lytle and Sons, one of southern Ohio's oldest and most trusted custom application businesses. "Our sales have jumped every year since 1944, and I'm sure they're going to keep right on going."

Within a 25-mile radius around greater Cincinnati, Lytle and Sons carry out expert custom spray and weed eradication programs for such major accounts and operations as General Electric, Proctor and Gamble, hospitals, municipalities, cemeteries and the billboard industry. Forrest Lytle speaks proudly of the growth of his business.

"We started out in business with $1,100 — the cost of our first sprayer," says Lytle. "Despite forecasts of doom from some of our friends, our business volume has skyrocketed about 3000 percent since our first year of operation."

The success of Lytle & Sons is due in large measure to Forrest Lytle's keen awareness of knowing exactly what the customer wants — and then delivering, first time, every time.

"The customer wants to see results — plain and simple," says Lytle, "and we give him results. When we promise to get rid of weeds around a city's baseball diamond, we do it — no if's, and's or but's."

Attesting to the success of this basic common-sense business philosophy is the fact that the best advertisement for Lytle and Sons is a job well done.

"We're in our 30th year of business and we've never used a newspaper advertisement or anything of the kind," proclaims Lytle. "We depend solely on personal recommendation and word-of-mouth. We know that your best advertisement is to do your job right. Ninety percent of all our business is repeat business. We've found that a lot of our work comes from companies telling each other about us. Of course, the product you use is also extremely important."

For his general weed killing programs, Forrest Lytle uses Daconate, a postemergent herbicide. He normally mixes Daconate at the rate of three gallons per 100 gallons of water.

"That's my recommended knockout dose," the colorful applicator says.

"Daconate takes weeds right down; it hits hard and does the job quickly. Daconate usually gets results for us in three days, although when applying it on really hot days, you can turn around and see the weeds burning up right behind you."

"Two years ago we sprayed soil sterilants between Christmas and New Year's — the first time in my 30 years in business that we sprayed for chickweed in the wintertime," Lytle exclaims. "Then, last spring there was so much rain we didn't turn a wheel until May — the weather has a tremendous impact on our business."

"In the beginning we had to hit weeds several times in a season," Lytle explains. "However, with the chemicals available today, we hit them once and they're dead, although in a few cases we have to

(continued on page 26)

Aerial applicators:
want to take off with this kind
of drift control?
You can. Just use Lo-Drift™ spray additive the next time you fly on an Amchem herbicide.
What you see here ground-applied is what you'll get airborne—a major reduction of fines that can cause drift problems. Instead, the spray is made up of large, heavy droplets that fall faster, stay intact, and land where you want them. And stick better, too. Because Lo-Drift not only increases droplet size, it helps them to adhere to foliage.
Lo-Drift mixes readily and requires no special nozzles or mixing/spraying equipment. It won't corrode equipment, and clean-up is simple using just water.
Chemical cost? As little as a penny a gallon of mix. Is there a more economical way to help prevent drift problems from shooting you down? Ask your dealer for a Lo-Drift pamphlet. Or write: Marketing Manager, Industrial Products, Amchem Products, Inc., Ambler, Pennsylvania 19002.
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More than 1000 weed scientists listened to over a 150 papers during this year's meeting. Here, friends gather in informal discussion while others hurry to hear another paper.

First place graduate research paper award went to B. C. Troutman, University of Arkansas (1). It was presented by Dr. Dave N. Weaver of Texas A&M University. Troutman received $50 in the competition.

Southern Weed Science Society Report

WITH the determination of General Grant's army sweeping toward the sea a battalion of more than 1000 weed scientists marched to Atlanta in January for the 27th annual meeting of the Southern Weed Science Society.

They came by the hundreds — extension weed specialists, research scientists, Federal and state workers, chemical manufacturers, and more — until the Sheraton-Biltmore Hotel virtually jumped with activity. Few can say that their attendance at this meeting didn't spark enthusiasm to return home and do a better job. The Southern Weed Science Society continues to stimulate the young and old (or the experienced and the not so experienced) alike.

Theme for this year's meeting was "Weeds — Environmental Bandits." And, if in a small way, this theme noted the tremendous need of the environmental protection chemical industry to tell the American consumer the role chemicals have played in the production of quality food and fiber as well as in turfgrass care and industrial weed control.

Dr. Allen F. Wiese, president of SWSS, pointed to this need in his keynote address. Speaking on the subject "Are Herbicides Environmental Contaminates?" he said that weed scientists have done a good job of keeping each other informed. "On the other hand we have failed to tell people outside of agriculture that herbicides are not only valuable tools, but absolute necessities for modern day agricultural production," he said. "We have done a worse job when it comes to relating the environmental impact of herbicide usage."

The weed scientist later said that "We have neither a problem nor a

A panel on "How weeds affect the environment" was presented by five industry leaders. They are: (1-r) Dudley T. Smith, Texas Ag. Expt. Sat., College Station, Tex.; A. E. Smith, Ga. Ag. Expt. Sta., Experiment, Ga.; John H. Kirch, Amchem Products, Inc., Ambler, Pa.; and Dr. Robert D. Blackburn, ARA, USDA, Ft. Lauderdale, Fla. Not shown is John A. Long, O.M. Scott and Sons.

There was standing room only in this section on control of Weeds and woody plants on utility, railroad and highway rights-of-way and industrial sites. Papers were presented on three experimental compounds, Spike tebuthiuron, Krenite brush control agent, and Roundup glyphosate.

For More Details On Preceding Page Circle (139) On Reply Card

serious environmental pollution with herbicides."

"Our challenge is to set the record straight. We must be our own public relations people and tell the story that herbicide usage is not causing contamination of air, plants, soil, or water," he said. Dr. Wiese then reported on studies which supported his premise.

Anyone who has attended SWSS before, or a similar type meeting, is familiar with the groupings of speaker presentations in sections. In a sense sections at SWSS represent "environments of interest." Early in the meeting, program chairman Dr. Paul W. Santelmann combined the thoughts of these various "environments into a symposium "How Weeds Affect Specific Environments."

Speaking on the aquatic environment was Dr. Robert D. Blackburn, ARS, U. S. Dept. of Agriculture, Ft. Lauderdale. "Although aquatic weeds are of less importance when compared to terrestrial weeds, aquatic weeds can present the greatest health hazard," he said. "Aquatic weeds provide harborage for mosquitoes, and the snail, intermediate hosts for a variety of trematodes which adversely affect the health of man and animal." Attempts to control snails are often hindered by massive aquatic weeds.

New officers of Southern Weed Science Society are: (back row 1-r) Dr. Donald E. Talbert, secretary-treasurer; M. M. Merkle; H. A. Greer; Dr. Gale Buchanan; (front row 1-r) Dr. Allen F. Wiese, past president; Dr. Paul W. Santlemann, president elect; Dr. William G. Westmoreland, president; and James Becton, vice president.

Blackburn pointed out that aquatic weeds reduce shoreline property values, create odor and interfere with aquatic recreation sports. He challenged those present as to

(continued on page 38)

The Green PARK Rabbit symbolizes the fast start and seeding vigor for which PARK variety Kentucky bluegrass is famous. It is the registered trademark of the Northern Minnesota Bluegrass Growers Association . . . the original producers of PARK.

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America's No. 1 certified bluegrass from its No. 1 producer

More acres of PARK Kentucky bluegrass are grown in the United States each year than any other variety of certified Kentucky bluegrass.

It was the Northern Minnesota Bluegrass Growers Association which first introduced PARK to the commercial market . . . and the association remains the primary supplier of certified PARK seed.

Fact Sheet, prices and other information is available from Twin City Seed Company, exclusive distributor for all PARK variety Kentucky bluegrass grown by the Association.

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For More Details Circle (111) on Reply Card

Two men oin a 40 foot section of PVC pipe with another. It is linked to a sprinkler head on the edge of a green.

This system features individual head control, to allow for the different water needs of certai areas on the course.

Using PVC for the pipe network also meant the irrigation contractor was able to make length adjustments easily.

A Golf Course In His Majesty's Honor

IF King James II of England was alive today, he could see what has happened to a certain 2500 acres of land he granted to 17th century colonists for settlement in the New World.

But he'd probably pinch himself to see if he was dreaming. History has it His Majesty was a bona fide golfer. The showpiece on that 2500-acre site is now a 54-hole golf course named (of course) King's Grant Country Club.

It's all part of a $200 million land development project located 15 minutes from Philadelphia and 40 minutes from the Atlantic Ocean; a project intended to be an entirely new, planned community for 30,000 people. The first 18 holes of the course layout, a championship course set amid the pine barrens of South Jersey and a meandering stream, will be playable this spring.

To give the course an historical flavor, the project developers (Evesham Corporation, a subsidiary of Seltzer Brothers) imported Frederick W. Hawtree, noted English golf architect, as a design consultant. William Seltzer president of Evesham, envisions the original course as someday being the site for a major USGA tour event.

But even in its developmental stage, the course has several interesting qualities. For example, sand and sandy loam topsoil led Evesham landscape architect Michael Kihn to specify that the turf be maintained with an automatic irrigation system featuring double row lines on several fairways.

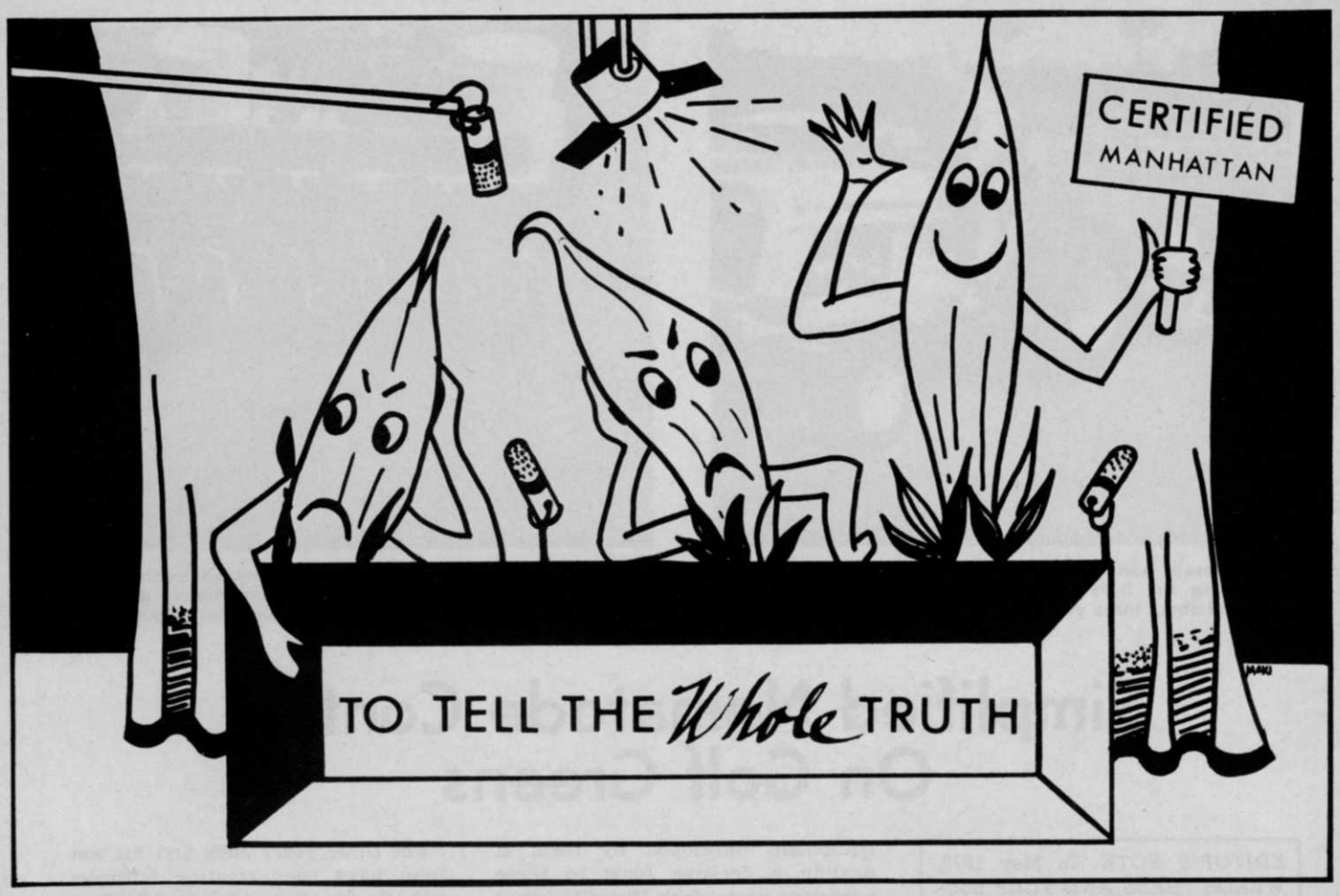
"Water percolates through the turf and topsoil very quickly," says Kihn. "This is good for drainage purposes, but poor for retention and turf life. So we need a fully irrigated course, even though this area has a very high water table."

To install the irrigation system required the combined expertise of Kihn; Philadelphia Toro Co., designer of the system; the irrigation contractor (John P. Schmidt Co.); the general contractor, (Harold E. Bishop, Inc.); a hydraulic project engineer (James William of Evesham); and the underground transmission system manufacturer (Cer-

(continued on page 44)

This pipe os light weight. One man can handle 40 foot sections with ease. No special handling equipment is needed.

Solvent welds are completed in minutes. Interior of bell and end of one section is coated. Exterior of the spigot end is coated. Joining is done manually.



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Manhattan perennial ryegrass is a fine textured perennial ryegrass developed by Dr. Reed Funk, Rutgers University. This new, improved, fine textured grass is genetically pure and great care is taken by Manhattan Association growers who plant only foundation seed stock. The seed is produced by members of the Manhattan Ryegrass Growers Association who agree to strict rules of growing, to protect the crop from cross-pollination and other contaminants.

The seed produced by these growers is closely watched and both field certification and seed certification are required before the seed is released to you, the customer.

Any seed bearing the name "Manhattan" but which does not carry certification tags may not be truly Manhattan. The variance could be drastically untrue of variety.

For your protection — buy only Certified Manhattan; why take a chance on imitations?

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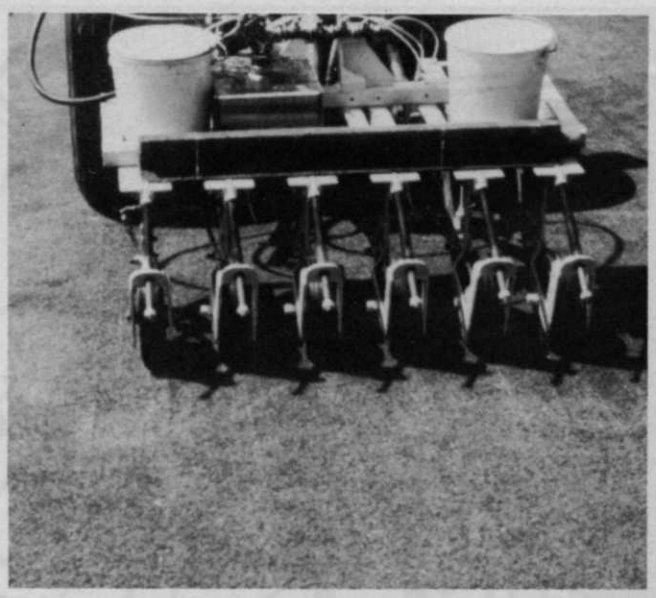
For More Details Circle (115) on Reply Card

John Russell, son of owner, operates the greens model fumigating rig. It is smaller than the fairway model rig devloped about three years ago.



Note that there is very little damage created by the fumigating rig. Golfers can play almost immediately after injection. These photos were taken by Dr. Don Dickson, extension nematologist, Univ. of Fla.

Simplified Nematode Control On Golf Greens

EDITOR'S NOTE: In May 1972, WEEDS TREES AND TURF published an article on Jack Russell, owner of Soil Fumigants Inc. At that time he had developed a way to inject Nemagon soil fumigant in the control of turfgrass nematodes. We recently visited with Jack Russell again to inquire about new developments. The following article reports on these changes and the increased interest in Russell's business.

BARE or sparsely covered areas of golf greens and other turf areas have been a maintenance problem as long as high turf maintenance has been practiced. Soil insects, extreme pH conditions, soil fungi, poor drainage and dry spots can often cause such problems. However, it is now being recognized that nematode damage to turf roots in many areas is the most frequent offender.

One company to take advantage of research tests on this problam is Soil Fumigants Company, Orlando, Fla. They've witnessed the worked accomplished by Dr. Vernon Perry and Dr. J. R. Christie of the University of Florida. Results of field demonstrations by Dr. Granville Horn have been carefully stored in their files for customer use. Yes, Soil Fumigants Co. is definitely in the business of fighting nematodes. And equipment developed by them is dealing a decisive blow to these voracious pests. Jack Russell, owner of Soil Fumigants Co. uses Nemagon soil fumigant because it has been proven to be reliable.

Most highly maintained turf areas such as golf greens must be handled with care, he says. Machinery must be used that disturbs or damages the turf the least.

"We first selected a lightweight but adequately powered tractor unit, he continues. "Then soft balloon tires — actually used airplane tires — with little or no tread were mounted on the tractor so that the turf surface would not be marred with cleat marks." Another requirement of the tractor was an adequate hydraulic lift to handle the weight of the injection unit.

The next requirement of their injection machinery is a set of six sharp and thin shanks to slice the turf and allow the nematicide into the root area. Russell sets shanks at eight inch intervals to give the best fumigant distribution. Packer wheels close the slits in the sod with such perfection that particular golfers may play immediately following the treatment with no putting problem.

"In fact, it is very often difficult to follow the line of last injection," Russell inserts. "The thin cut in the turf is usually not visable after three or four days."

For three years Jack and his son John have been treating fairways and other large turf areas with similar but heavier equipment. Results have been extremely satisfying, according to the duo. Most superintendents have voiced the opinion that this method of turf nematode control using the injected Nemagon has been the best money they have ever spent for improving the vigor of turfgrasses, reports John.

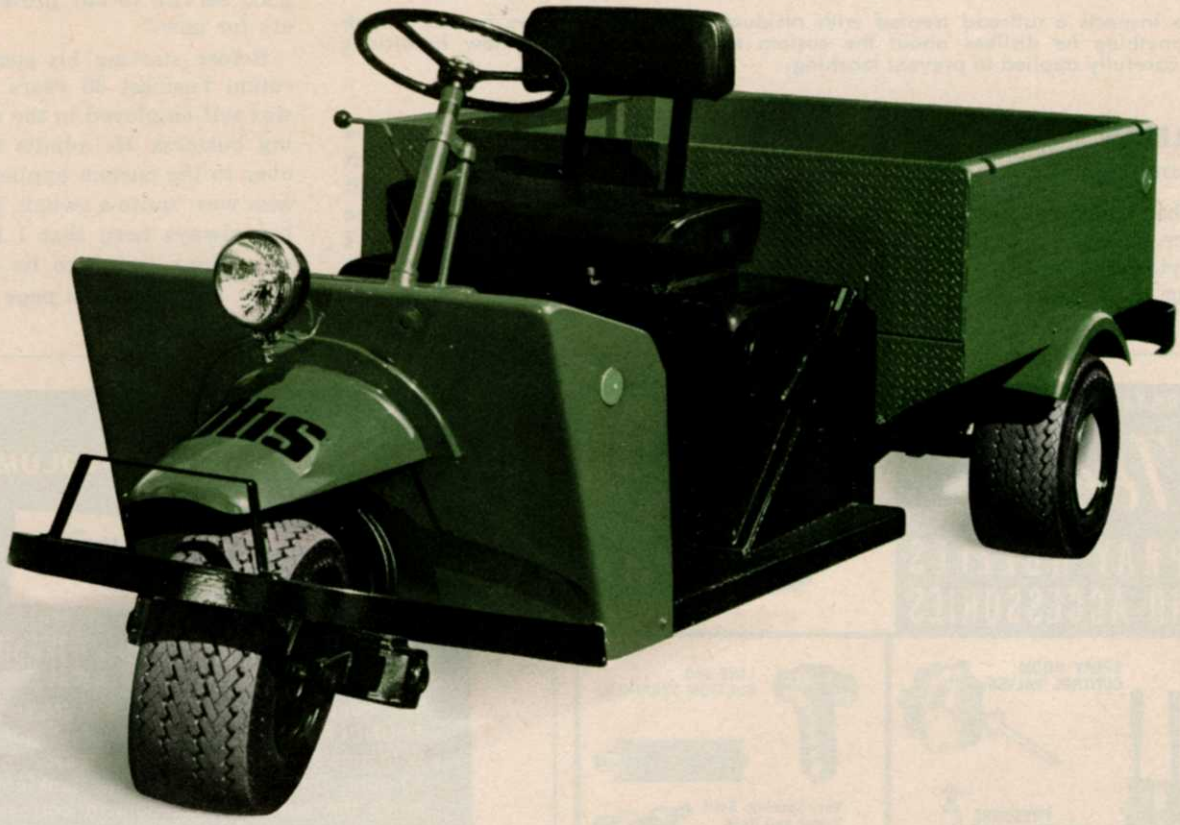
The cost of fairway fumigation averages about $50 per acres for material and application. "A single treatment will remain effective for one to two years," says Jack. "We've noticed that fumigated turf appears to be healthier. This vigor has reduced the need and the cost of numerous applications of herbicide. A vigorous stand of turfgrass crowds out many problem weeds. Plant parasitic nematodes are harmful to most turfgrasses, but unfortunately the weeds seems to survive best. In fact, weeds seem to thrive in soil with a high nematode count."

Since the Russell's small fumigation rig is usually used on turf areas of high maintenance, they use a slightly higher rate of Nemagon — from 30 to 35 pounds per acre — for more complete control. There's a decided response in turf at this slightly higher rate, notes this applicator.

What does it cost for fumigation of

Continued on page 46)

We drove the Otis Turf-Aul hard in the rough to make sure it went easy on the green.



Otis driver Lee Trevino found out what grounds crews have known for years: The Otis® Turf-Aul does everything better—and for less. Hauling, spreading, irrigating, or whatever, the Otis Turf-Aul saves time and manpower because it's the toughest vehicle of its kind. Tough—but with a gentle touch. The Otis Turf-Aul has wide, wide tires that never damage turf. In fact, you can even drive it on greens without leaving a trace.

The 3-wheel Otis Turf-Aul offers a broad range of attachments and modifications. There's a combination available that will suit your needs exactly. Write the factory for the name of your Otis dealer, and prove it for yourself.

Otis Elevator Company
P. O. BOX 8600
Special Vehicle Division Stockton, California

Just ask our driver.

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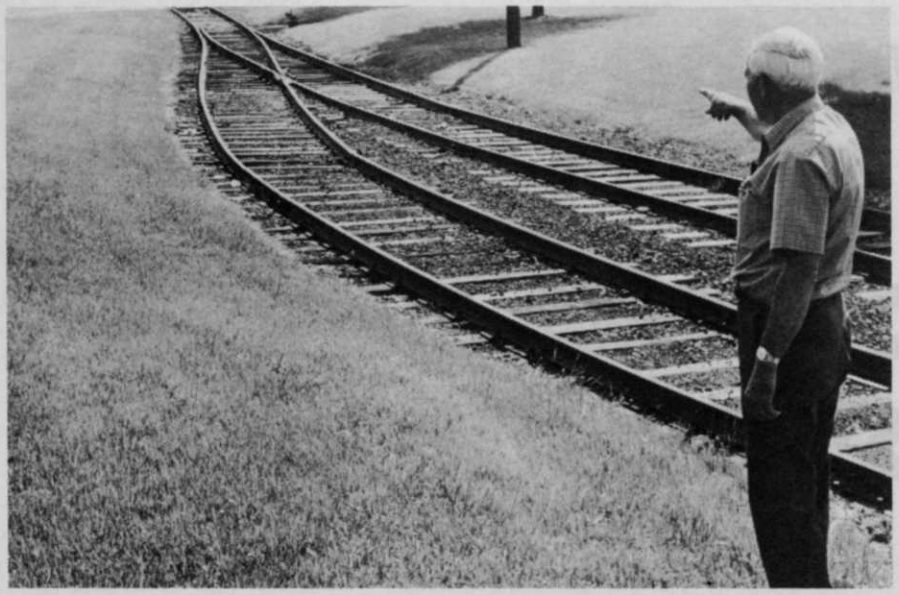

Lytle inspects a railroad treated with residual herbicides. He says he can't think of anything he dislikes about the custom spray business. Note how herbicides are carefully applied to prevent leaching.

SALES UP

(from page 18)

go back and hit the tougher ones twice a year."

Lytle says he can't think of anything he dislikes about the custom spray business, "only that you have to be real careful about wind drift and leaching. If these chemicals hit a tree, it's 'curtains.' By the same token, this power is exactly why I use these sterilants, like Hyvar X and others."

The firm, which now has 12 employees, was one of the first custom application businesses in the greater Cincinnati area. The company owns eleven trucks and a wide variety of "Hi-Boy" and other spraying equipment suitable for tackling almost any type of commercial spraying job. Lytle serves customers in northern Kentucky and as far west as the Indiana line. Despite his firm's success, Forrest Lytle doesn't plan any expansion in the near future.

"We have no plans to enlarge our territory at the present time," he says, "although we've had plenty of offers. We were offered a nice chunk of the billboard business in Cleveland but turned it down. We want to continue our loyalty and good service to our present customers for now."

Before starting his custom application business 30 years ago, Lytle was self-employed in the meat packing business. He admits the change over to the custom application business was "quite a switch. My trouble has always been that I like to get in a place, run it to its top dollar,

(continued on page 34)

SPRAYING SYSTEMS CO.

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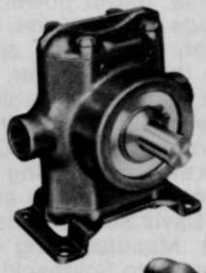

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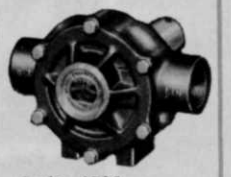

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GYPSY MOTH

(from page 16)

"We plan to keep using it, especially where the moth is more than just a nuisance," Gauer said. "We use it for several reasons. It works. It's biodegradable. And it's very well accepted by our customers . . . they ask for it by name."

Pete Woodcock, City Forester for Scarsdale, N.Y., used the product this past season to protect some 70 miles of roadside trees and 125 acres of parkland. Woodcock termed the results "excellent."

Woodcock's men applied the bacillus compound with a mist-blower at the rate of five to seven pounds per 100 gal. of water. The Scarsdale oaks, maples, sycamore, birch rhododendrons and shrubbery received a one-shot treatment.

CITIZENRY INFORMED

The local citizenry was informed of the decision to switch to a biological insecticide via the Scarsdale *Inquirer, Village Report* (a quarterly report that goes to each Scarsdale household) and Village Board meetings.

The response?

"The local Audubon Society chapter, and other concerned groups were ecstatic that the Village had taken the initiative to go to a biological insecticide," Woodcock said.

"The cost is high," he said, "but not excessive when you consider the results. I prefer the wettable powder because there are no mixing or storage problems. Best of all, it's effective."

Byron Lynch, an aerial applicator on Long Island, has sprayed some 2000 acres for gypsy moth over the past two seasons.

"It's a fantastic product," Lynch said. "It works all the time." He believes that the key to success in treating for gypsy moth is timing.

"All my customers were very satisfied," he said. "It provides the kind of excellent control that traditional organic phosphates no longer provide due to resistance buildup.

"Then too, there are the outstanding ecological advantages," Lynch said. "We don't have to worry about killing non-target insects, birds, etc. But the main reason I use it is that it works."

Bryon Blundell built his spraying business, Evergreen Enterprises in Wilton, Conn., by using ecological products. Treating for gypsy moth is a matter of ethics with this native-born Britisher.

Last year he sprayed about 500 private properties using two 35 gal./min. Hardie sprayers. His typical job is one-half acre.

Any disadvantages?

"One has to take a bit of care on rainy days," Blundell said. "Since Dipel is not a contact kill insecticide, a heavy rain can slow down its action. I don't spray if rains threaten and my schedule is not too oppressive, or I use a contact pyrethrum compound."

"I can foresee the day when biologicals will be just as high volume an industry as traditional chemicals are now," said Art Hohmann, Conservation Control Tree Specialists, Huntington, L. I., N. Y. "We're looking to the future with Dipel. We expect it to be our major spring chemical.

Larvae eat everything in sight, especially young oak leaves. Frequently, however, the larvae do not eat the entire leaf, devouring only enough to do irreparable damage.

Byron Lynch, an aerial applicator on Long Island, has sprayed 2000 acres for Gypsy Moth during the past two seasons.

"We enjoyed very good control last season," Hohmann said. "Of our 50 or so customers only two complained. That was because it rained within 12 hours after application."

He sprayed approximately 100 acres of privately-owned oak, maple and ash. For cankerworm, he applied Dipel at ¾ lb./100 gal. of water; for gypsy moth, 1 lb./100 gal. of water. It also mixes well with fungicides, and liquid foliar nutrients.

"The safety . . . that's what we sell," he says. "Someday we'll have an all biological program." Many of his customers ask for this biological product by name. Part of the reason is that Hohmann promotes the ecological aspects of this material to local garden clubs. The Long Island arborist also makes a point of telling customers and potential customers that although this insecticide will take a bit longer to kill the caterpillar, feeding damage ceases within hours. "And that's the main thing," he says.

Dipel was also effective last season in the Midwest against an old pest, the inchworm (or cankerworm).

"I could see the eggs all over my trees," said Robert F. Kroschel, Bensenville, Ill. "They were really loaded."

Kroschel sprayed his 25 ft. fruit trees three times in six weeks starting in mid-May. "I like it because it mixes well and doesn't harm birds or the ecology," he said, "and also because it's effective."

He also takes pride in his pair of 100-year-old Downy Hawthorne trees. The species has a height of just about 10 ft., with a mushroom canopy that spreads over 30 ft. He treated these for inchworm. Results

(continued on page 34)

Glade

KENTUCKY BLUEGRASS
U. S. Plant Patent 3151

A new natural team, Glade Kentucky bluegrass and trees! Glade performs well in moderate shade, especially when mixed with fine fescues. A selection from Rutgers University (tested as P-29), Glade is an improved, low-growing, medium to dark green grass with fine leaf texture and thick, rapid-growing rhizome and root system. Glade has good resistance to important turfgrass diseases including stripe smut, leaf rust, and powdery mildew. Like boys and trees, Glade and shade go together. Mixed with other elite bluegrasses and fine fescues in moderate shade, Glade is a natural. Get new Glade at local wholesale seed distributors.

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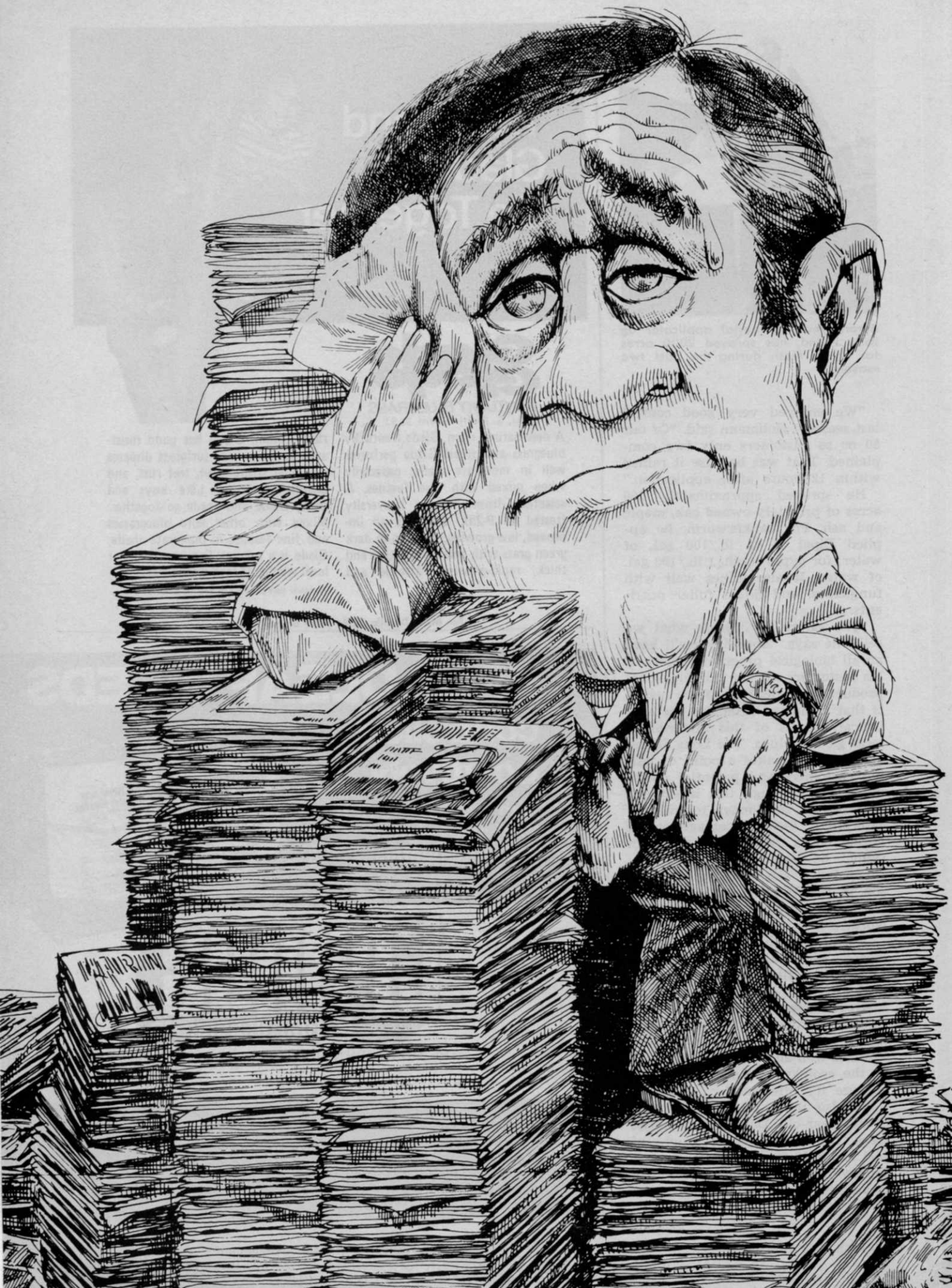

At last. Help is on the way.

Today, selecting business papers can fast become a very large headache.

It's no wonder when you consider that there are some 2,335 business publications to choose from. This mind boggling choice makes media selection both difficult and time consuming.

And what makes it even worse is that many of these publications are not even audited by either of the two well known auditing organizations. To be specific, only 867 or 37 percent of the 2,335 business publications are audited by either ABC or BPA.

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On May 1, 1973 the American Business Press will take an important step towards simplifying the task of selecting trade and technical journals. And thus making it easier to separate the wheat from the chaff.

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This star will make it easy for you to spot the publications that meet the association's stringent membership criteria. (Less than 30 percent of the 2,335 trade publications are eligible for membership.)

In order to be elected to the American Business Press a publication must (a) have its circulation audited by an independent, tripartite auditing bureau, (b) be independently owned and taxpaying, (c) agree to abide by ABP's Code of Publishing Practice.

In other words, the publisher must agree to adhere to the highest standards of business publishing. And be dedicated to the interests of his readers, not only to the interests of his advertisers.

Look for the star before you buy.

A majority of American Business Press members have agreed to put the star where you can find it easily.

Big enough for you to see it without your glasses.

By trusting your budgets to the business publications that wear the star, you'll know you're getting the most for your advertising dollar.

So, be on the lookout for the star. To make your search easier, we've prepared a pocket-size directory which lists all star-carrying publications. You can obtain a copy of this guide by writing to the American Business Press, 205 East 42nd Street, New York, N.Y. 10017.

Send for it. It's going to give you the help you've never gotten before. You might even be able to throw away your aspirin.

Pete Woodcock, city Forester for the Village of Scarsdale, N.Y. applies funficide for Dutch Elm Disease. Earlier he treated 70 miles of roadside folliage and 125

GYPSY MOTH

(from page 29)

were excellent. Kroschel's 30 ft. white ash and 50 ft. silver maple were also plagued with inchworm until he used Dipel.

"Excellent results," he summed up. "I made certain to saturate the under and upper sides of the leaves, using from 200 to 300 lbs. pressure with a power sprayer.

Fred Jorgensen of Palatine, Ill., is another Chicago-area homeowner who is pleased. "I don't like to use poisons," he said. "I'm always the first to try any ecological product."

He applied Dipel at the recommended rate to the four maple trees in his yard to halt the spread of inchworm. "It really does the trick," he said.□

Portable Bubble Displays Ready For Toro Dealers

Operating models, to display the performance characteristics of a new gear-driven rotary sprinkler head, are being shipped to distributors and dealers throughout the country by The Toro Company's Irrigation Division.

The portable, self-contained displays will be used to demonstrate how the Toro 300 Series Stream Rotor sprinkler head is capable of delivering accurate, large-area coverage at extremely low precipitation rates and reducing the cost of automatic irrigation systems.

The company expects to produce more than 100 display units for use in distributor and dealer showrooms and by installers at home shows and such other places as bank lobbies and shopping malls.

The unit consists of a plexiglass bubble enclosing a single stream rotor head connected to a fiberglass tank containing five gallons of water. The water is circulated through the head and back into the tank with an electric submersible pump.

The head was invented by Edwin J. Hunter.

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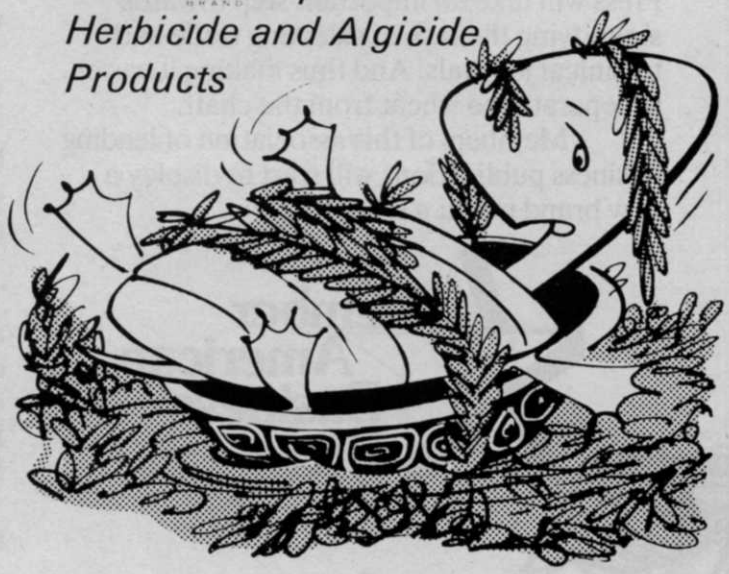

For information on this new and growing line of 3M aquatic weed and algae control products, write: Plant Care Systems, 3M Company, 3M Center, P.O. Box 33050, St. Paul, Minn. 55101. Or call 305/943-0481.

3M COMPANY

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Get rid of unwanted green growth before it cuts into your profits.

The weed onslaught is just about universal.

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For utilities, railroads, highway departments, the petroleum industry and industry in general.

But there is a way to control that costly green tide—with Tandex® herbicide.

It's a urea-carbamate compound that gives outstanding extended control over a range of weeds and grasses.

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It's brush control, too. If you've got to get rid of really tough brush and woody vines, Tandex gets the job done.

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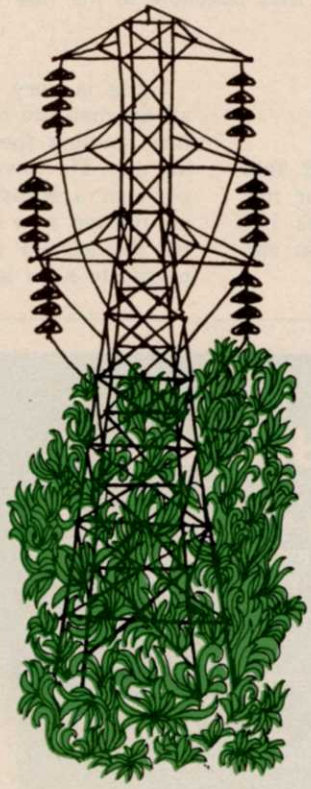

FOR UTILITIES

FOR ROADS

TANDEX HERBICIDE

Agricultural Chemical Division
FMC Corporation, Middleport, N.Y.

FMC

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This parking lots was treated with bareground herbicides to prevent weed growth. For general weed control, Lytle uses Daconate at the rate of three gallons per 100 gallons water.

SALES UP

(from page 26)

and then, unfortunately, find that I have lost interest in it. For me, the custom spraying business has always been a challenge. You can get as big as you want to."

Lytle is very careful to see that all his men are properly trained before sending them out on a spraying job. He never lets a new man perform a spray assignment alone, no matter how simple or routine. By the second year, a man is expected to have learned the basics of the business quite thoroughly, although Lytle still personally supervises most of the work himself. "Turf jobs, especially, require a real professional touch," he cautions them.

For a large customer, like Proctor and Gamble's big Cincinnati plant, he maintains 54 acres of railroad tracks alone, in addition to actual plant areas and parking lots, which he keeps absolutely weed-free. For railroad track areas, Lytle uses the spot-kill properties of Daconate to prevent any damage to surrounding trees. During the plant's regular working week, it's almost impossible to take care of the track areas because of the constant railroad operations, so Lytle and Sons cover that big job—all summer long—on weekends.

In addition to Proctor and Gamble, Lytle and Sons use Daconate, or a tank mix of Daconate and Hyvar on other vegetation-kill accounts including such heavy Cincinnati-area industries as Pollack Steel, Millicron, General Electric and Ashland Oil. For these jobs, Lytle tackles everything from parking lots and fences to keeping river banks free of unwanted growth. He

(continued on page 36)

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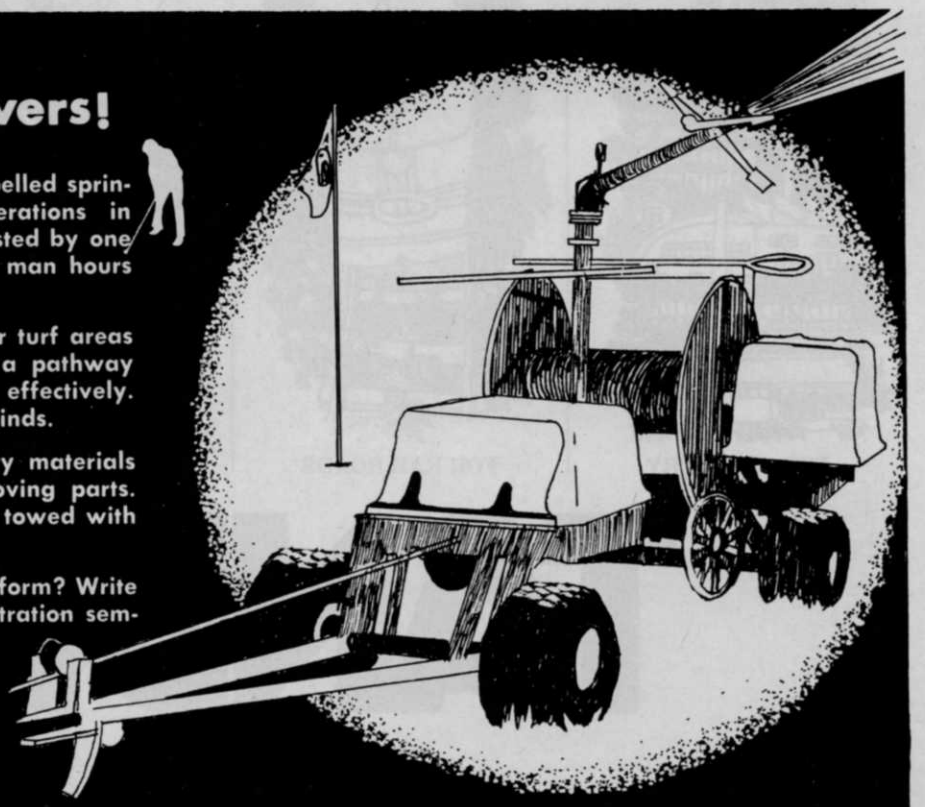

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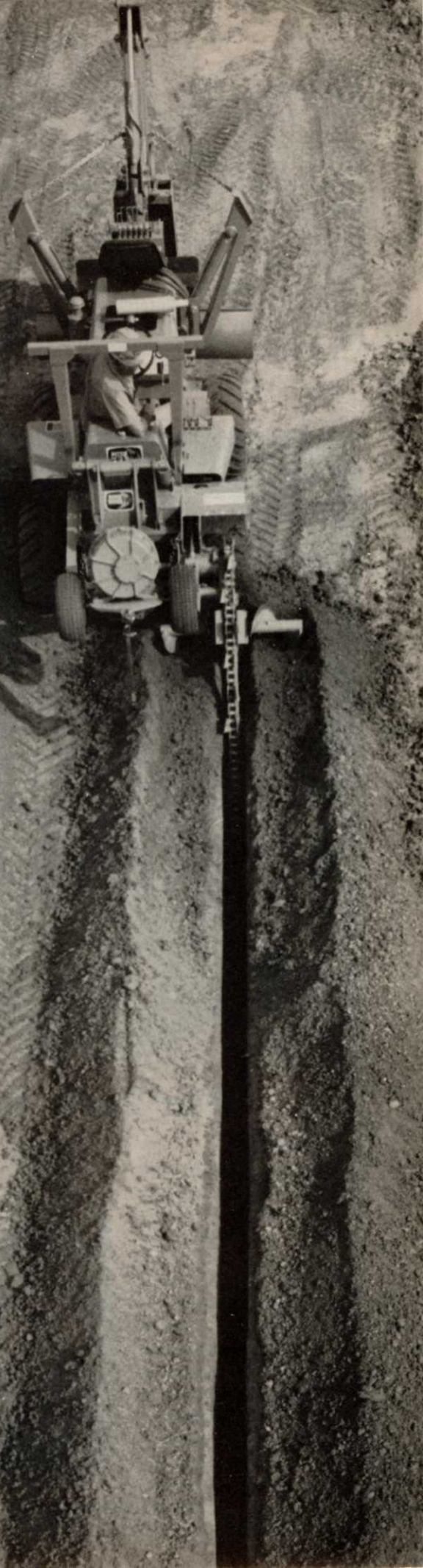

No other single piece of underground construction equipment can do as many things as the Ditch Witch Combo. A fully-equipped Combo will trench, backfill and do backhoe, vibratory plowing and boring operations. Your operator can switch from one operation to another without adding or changing attachments.

The basic Combo comes equipped with offset digging assembly and vibratory plow; add additional modular components as you need them. Installation is fast, simple and requires no modifications of the basic vehicle.

Combos are available in three sizes ranging from 30- to 65-horsepower. Each give you all the proven Ditch Witch design advantages that have made Ditch Witch the leader in its field.

The best way to see what a Combo can do for you is to see it in action on your job. Name the time and place and Ditch Witch will be there. Compare the Combo with what others have to offer. We'll tell you now, though, the others will have to bring more than one machine to match our Combo's capabilities. Because the Ditch Witch Combo is in a class by itself.

DITCH WITCH

Charles Machine Works
P.O. Box 66
Perry, Oklahoma 73077

SALES UP

(from page 34)

also handles spraying activities at a number of cemeteries. In addition, Lytle and Sons keep over 500 area billboards free of obstructing weeds and fast-growing vegetation and also maintain a large number of golf courses, swimming pools and tank farms. Recently, he sprayed a 6½-mile section of Interstate 75 near Cincinnati but doesn't plan to take on any more highway contracts.

One of the most unique aspects of Lytle's operation is the cost of equipment. For most of the sterilization work, ordinary 55-gallon oil drums are used as spray tanks. "I use drums for two reasons," expounds Lytle. "First of all, they are cheap." Secondly, at the end of a use period, I can dispose of them and there is no expensive spray tank to clean out, repair or replace. Along with these bargain basement tanks, Lytle combines another cost saving innovation—his spray pumps. A Hahn 5-horsepower gear pump with a 15-gallon per minute capacity is used. Attached to this is a light ⅝ inch, two-braid chemical hose.

In the final analysis, the key to Lytle and Sons' success seems to lie in Forrest Lytle's all-out enthusiasm to do an unconditionally first-rate job.

"A lot of guys have tried this business part time—but it's not a part-time business. Any job in this field—if it's worth doing—it's worth doing right."

Lytle's several hundred customers seem to agree.□

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Water Hyacinth Nutrient Potential Explored

Complete removal of the water hyacinth and subsequent disposal in soil would alleviate the nuisance in affected water, lower the nutrient content of those waters, and benefit the receiving soil. This is the conclusion of two University of Florida researchers.

J. V. Parra and C. C. Hortenstine contend that the organic matter content of water hyacinths would improve the sandy soils in Florida. Characteristics such as structure, cation exchange capacity, buffering capacity and water holding capacity would be improved.

In addition, organic matter serves as a storehouse of macronutrients and micronutrients.

According to the scientists, water hyacinth is considered a major deterrent to water sports and water transportation in many parts of the world. The rank growth becomes particularly obnoxious in lakes and streams that are eutrophic. In Florida, annual costs for control of this weed amount to several million dollars.

Most control procedures are predicated on the use of chemicals which allow the hyacinths to become part of the debris and, thus, constitute a permanent sink for nutrients.

Speaking at the Weed Science Society of American meeting in Atlanta, recently, the scientists reason that nitrogen is of especial interest when an organic material is applied to the soil. The total nitrogen content of water hyacinths varies generally between one and two percent. However, the carbon/nitrogen ratio is probably of greater importance.

Normal soil has a C/N ration between 9 and 12 which is maintained at almost a fixed value. When organic matter with a C/N ratio greater than 12 is added to soil, microorganisms must draw upon the soil nitrogen in order to assimilate or absorb the added carbon.

For More Details Circle (104) on Reply Card
For More Details On Preceding Page Circle (114) On Reply Card

Labor Cost Savings In Colorado

Nestled high in the Rocky Mountains, at the mouth of Boulder Canyon in Colorado, the Boulder Valley Public School District encompasses 45 schools, with a total enrollment of over 23,000. The district covers a 500 square mile area—nearly one half of Boulder County. A profusion of pine and spruce trees, typical of the mountainous region, beautify the campuses of all the schools.

Maintaining the grounds of this vast complex is the task of the school district's plant and auxiliary services department, who recently purchased a Wayne Brush Chipper to facilitate their growing problems of brush and tree limb disposal.

Working eight hour shifts, the department trims more than 25 trees each week. In the winter months they work extra hours to dispose of the brush and limbs felled by winter snow and heavy storms.

Clarence O. Britton, Director of the Plant and Auxiliary Services, says, "Before using our chipper, we had to haul tons of brush in bulky loads to the dumpsite, at a cost of $12 per load — this in addition to the cost of labor to load the trucks. Now, using a dozer to make a pit area on our own property, we push the chips into the pit and simply cover them. Using a covered vehicle with a hoist, which the chipper itself blows into, it's simple to dump and begin cutting operations again.

"Our crew rates the safe operations of the chipper very highly, with the conveniently placed safety controls a definite advantage. They also appreciate its ease of maintenance and service, and especially ease and convenience in changing the cutting knives."

"It has been several years since a thorough trimming of brush removal program has been completed in our school district, he concludes. "Since purchasing our Wayne Chipper, we have completed a vast amount of work and effected considerable savings."

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SWSS REPORT

(from page 21)

whether man will learn to manage aquatic weed problems for his continued welfare.

The industrial environment segment of the symposium centered around remarks made by John H. Kirch, Amchem Products, Inc. He said that the total land acreage encompassed by the industrial category amounted to 538 million acres or about 25 percent of the total land areas of the U.S. "By far the largest segment, approximately 500 million acres, is in commercial forest land," he said. "Pipelines account for 3 million acres, railroads 2-3 million acres, electric and telephone rights-of-way 7 million acres, roadsides 15 million acres and industrial plant sites 10 million acres."

Economics plays an important part in controlling vegetation within industry. The risk of fire, the hazard of loss of communications systems, the ability to maintain pipelines or railroads — all share economics as a partner in getting the job done. Unwanted vegetation in these areas must be controlled or the cost of doing business will necessarily increase.

Kirch cited specific cases where vegetation control is vitally important to industry. "If we are to at least maintain the status quo," he said looking to the future, "it is important that the programs that minimize the impact of this vegetation on our industrial environment be continued." He seconded the need for managers within this specific environment to tell the story of what more than 25 years of cost-conscious effort in vegetation management has done.

John A. Long, director, biochemical research, O. M. Scott & Sons told delegates that the urban environment consisted of an industry valued at nearly $3.7 billion. Home lawn care alone accounts for $3 billion, he said. Golf course maintenance costs are estimated at $237 million annually, while cemetery maintenance amounts to $360 million per year.

Weeds affect the urban environment in numerous ways. Long said that the most obvious was in aesthetic values. "The less obvious, but perhaps of greater magnitude, are in terms of impact on utilization, economic returns, effects on health of man and animals, and effectiveness of land stabilization," he declared. "Chemicals utilized for weed control in the urban environment rank next to fertilizers in terms of quantities and value."

Other environments discussed in this symposium included pastures and agricultural crops.

In the daily section sessions, more interest was centered around aquatic weed control and industrial vegetation management than in past years. One only has to recall that as little as four years ago speakers in these sections were talking to nearly bare rooms. This year quite the opposite was true. It was standing room only most of the time. It reflects the change in interests of delegates. To a larger degree, however, it reflects an attitude change about vegetation management being only agricultural. The Green Industry with its arm wrapped around aquatic weed control is becoming better known. Opportunities are available. The future is exciting.

Take the sections on aquatic weeds, for example. Speakers presented topics ranging from tests on new compounds to how an aquatic weed problem was solved. R. Alt reported

(continued on page 42)

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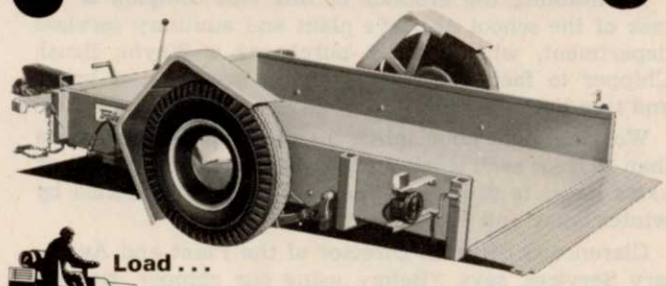
One Manhandling



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Gary Strome (left) receives the "Seedsman of the Year" award from the Oregon Seed Council at the Seed League meeting. Fenn Emerson, manager of seed division of Pacific Supply Co., made the presentation.

Green Industry Newsmakers

PEOPLE PLACES EVENTS

A groundskeepers at Bellengrath Gardens near Mobile, Ala. is fertilizing one of their large, valuable trees with Jobe's Tree Food Spikes. This new method uses a spike about the size of a railroad spike but is solid 16-8-8 fertilizer and is driven into the ground under the dripline.

The University of Tennessee held its Fifth Annual One Week Winter Short Course in Turfgrass Management at the Knoxville, Ellington Plant Sciences building facilities January 21 through 25, 1974, under the direction of Dr. Lloyd M. Callahan, Associate Professor, Department of Ornamental Horticulture and Landscape Design. Those in attendance, from left to right, front row: Reg Jellicorse, Eugene Miller, Lloyd Callahan, Chandler Hancock, James Breeding; second row: James Kirkley, John Petrie, Bob Wicker, Harold Baldwin, Jr., Sabina Totty, Larry Cromwell, George Huston, Art Mulwitz, William Fisher; third row: William Neal, David Hooper, Don Schmitt, Felix Kosinski, Steve Nunan, John Floyd, Kenneth Garland, Elmer James James Miller, Dennis James; and back row: Matthew Keith, Hugh Goodman, Jimmy Cagle, Daniel Kaltreider, Robert Emerson, Randall Lantz, John Beatty, Richard Medlen, Bob Seaman and Mike Ressler. Present but not shown in photo was Gary Seaman, Charles Eblen, Mike Holt, Mark Halcomb, George Hofstetter and Don Wilson.

H. B. Musser Turfgrass Foundation research grant is presented by Warren Bidwell, Congressional CC (left) to Dr. J. L. Starling, head of Penn State's Agronomy Department at Penn State's Turfgrass Conference, 1974.

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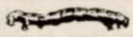
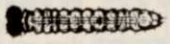
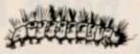


OAK MOTH LARVAE
Ca./trees & shrubs



CANKERWORM (Inchworm)
U.S./trees & shrubs

RED-HUMPED CATERPILLAR
Ca./trees & shrubs



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SWSS REPORT

(from page 38)

on the restoration program accomplished in Lake Eola located in the heart of metropolitan Orlando, Fla. He said that restoration consisted of partial lake drawdown, elimination of pollution sources and treatment with algaecide.

Dr. A. D. Worsham, North Carolina State University, reported on the use of herbicides to manage vegetation on dredge islands along coastal waterways. He said that these islands had become a habitat for birds, yet the encroachment of unwanted vegetation was not conducive to nesting. Applications of various bareground herbicides in tests resulted in the control of several undesirable weeds and promoted favorable nesting habitats.

Wayne Thomaston, Georgia department of natural resources, discussed "Methods and Herbicides Uses For Aquatic Weed Control In Small Impoundments In Georgia." Some of his observations were: 1. gravity flow applications of herbicides are recommended when possible. He thinks this is superior to spraying. 2. one gallon per surface acre of herbicide usually varies very little in parts per million in acid equivalent in Georgia ponds. 3. few farm pond owners understand parts per million or acid equivalent. Recommendations in gallons per surface acre are simpler to understand.

Bill Mixon of Pennwalt Corporation told the group that the liquid formulation of Hydrothal 191 is effectively used in most areas of the country for broad spectrum aquatic weed species. However, in Florida, the slow release pellet formulation proves superior.

Robert J. Gates, director of field operations, Southwest Florida Water Management District, presented an interesting discussion on control of submerged weeds by use of the bi-fluid-invert system. His contention is that it provides a high degree of safety, placing the material on the target with precision.

In the area of industrial weed control, a variety of papers were presented which drew keen interest among a capacity audience. Dr. Robert E. Eplee, agronomist, Animal and Plant Health Inspection Service, said that maintaining constant nozzle pressure is of prime importance in chemical application. It reduces the risk of drift and insures a more uniform application. He described a system employing a flow control valve.

V. David Perron, phenoxy products manager, Chipman Division of Rhodia, Inc., reported on developments in the Visko-Rhap system of drift control. He said that the Minnesota Wanner Company has developed an auxiliary kit which permits the operator to inject a particular chemical in a system which will control a specific weed. He cited the example where an applicator is primarily spraying for broadleaved weeds but encounters Johnsongrass.

Dick Fields of Velsicol Chemical Corporation spoke on a modified cane-low oil application of Banvel, Accutrol Adjuvant and water. He pointed out the economics of this system in view of the current shortage of fuel oil.

Along this same line, W. E. Chappell of Virginia Tech reported on the brush control studies conducted on rights-of-way. Noting the trend toward lower volumes of more concentrated sprays for woody plant control, he said that in order to lower the volume it was necessary to lower the pressure and increase droplet size. He tested many commercially available nozzles. The one most satisfactory in his tests was Spraying Systems flatjet P 13500. He said that with this nozzle, it was possible to get uniform coverage and little drive with volumes of around 30 gallons per acre and pressure 75-100 psi.

Also on the program were reports of new compounds still in the experimental stage of development. Dr. Aaron W. Welch of Du Pont discussed Krenite brush control agent. O. N. Andrews of Monsanto reported on Roundup glyphosate in the control of vegetation on railroad rights-of-ways. And D. H. Lade, Eli Lilly and Co., talked about Spike tebuthiuron as a new experimental herbicide for total vegetation control.

New officers of SWSS for 1974 are: Dr. William G. Westmoreland, Ciba-Geigy Corp., president; Dr. Paul W. Santelmann, department of agronomy, Oklahoma State University, president-elect; James Becton, Ciba-Geigy Corp., vice president; Dr. Ronald E. Talbert, weed science and physiology lab, University of Arkansas, secretary-treasurer; and Dr. James F. Miller, extension agronomist, weed control, University of Georgia, editor.

The 1975 meeting of the Southern Weed Science Society will be held in the Sheraton-Peabody Hotel, Memphis, Tenn., Jan. 20-23. □

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Another option available to the use of the Big Genie from Mathews Company is a 6 ft. lawn mower attachment, complete with 34-bushel hopper. It has a caster wheel assembly to prevent scalping on uneven terrain and leaf mulching screen and becomes a lawn mower, sweeper and mulcher all in one machine.

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FMC Environmental Equipment

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A trenching machine was the only piece of special equipment required to lay the irrigation system's pipe network.

IN HIS MAJESTY'S HONOR

(from page 22)

tain-teed Products Corporation).

The system is hydraulically operated and centrally controlled, with a satellite (individual fairway) control feature. The control system, directed from the maintenance building located near the clubhouse, is operated with a series of clocks and switches. It can put 1 in. of water on the fairways for 6 days, 8 hrs. per day; allowing for 1¼ in. on the greens and tees. And everything is accomplished at night. The system can also totally syringe the turf in 20 minutes during the day.

The irrigation system cost over $100,000 and took nine weeks to install. Yet it took only three men to dig the trenches and lay the piping/sprinkling network. The reason, says John Schmidt, is that Philadelphia Toro specified polyvinyl chloride (PVC) pipe, with handling and flexibility characteristics highly applicable to turf irrigation.

"PVC is the only way to go," says Schmidt. "It's all we ever use. Could you imagine how long the job would have taken with steel pipe or any other material using only three men?"

Williams who supervised construction of the course, agrees. "There are many advantages of PVC," he says. The C factor is better with PVC and then there's the cost."

Cost was a prime consideration, according to Matt Ledwith of Philadelphia Toro. "We saved over 50 percent in material cost on PVC in comparison with steel." Overall, however, Ledwith acknowledges that the fully automatic system will not deliver a sizable return on investment; "because the more the turf is irrigated, the more you have to mow it. So what you save in manual watering costs, you make up for in turf cutting labor. The chief objective of an automatic system is to provide more efficient turf management."

In the case of King's Grant, he continues, "where high temperatures and equally high humidity prevail for 3 to 4 months of the year, there is very little ground circulation. An automatic system syringes and cools the turf, balancing the temperature to help save it."

From the pumping station, which can produce 720 gpm at 125 psi, water moves through the 30,000 feet of piping at the direction of the central control system. Individual head control allows for differentials in water needs and winds.

Schmidt's employees required no special handling for installing the system, save for a trencher. Because of the light weight of PVC, sections

(continued on page 45)

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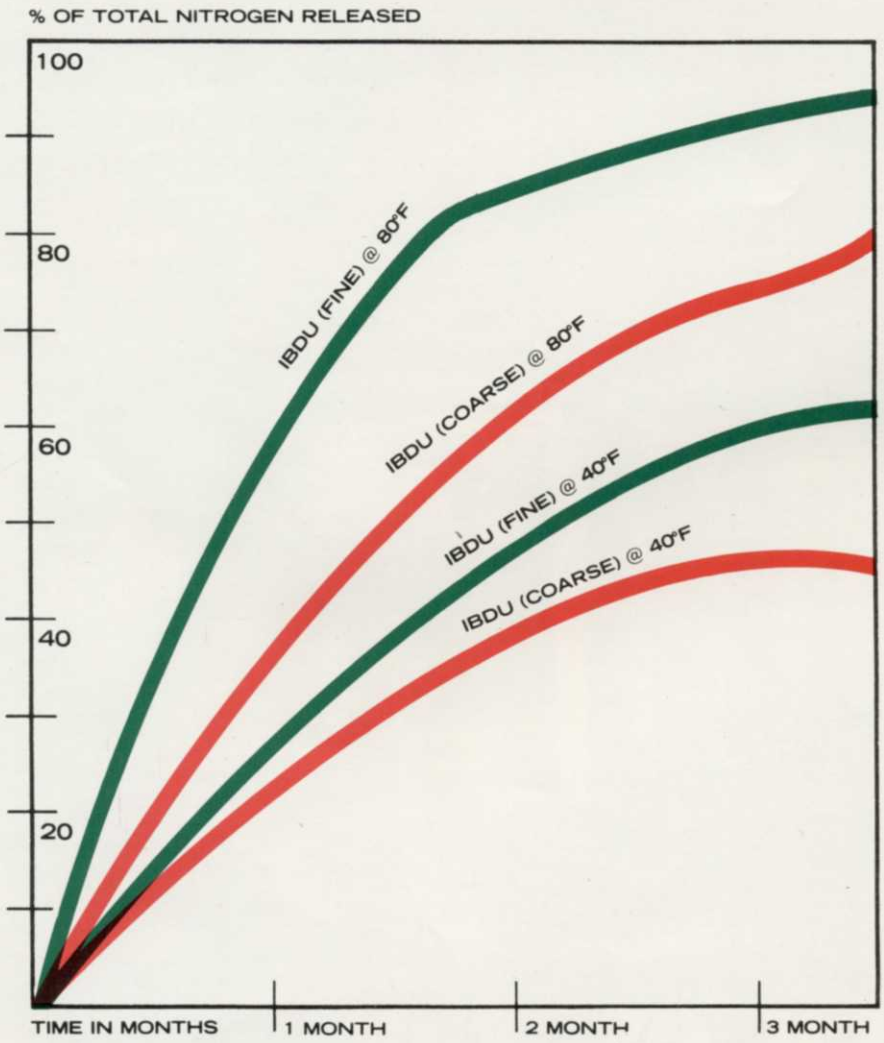

SOIL MOISTURE – 35% TEMPERATURE – 40-80°F.

The above chart shows that IBDU is only slightly affected by changes in soil temperature. In a temperature range from nearly freezing (40°) to very warm (80°) coarse IBDU will release 40-60% of its total nitrogen in a 2 month period, while fine IBDU releases somewhat faster.

UF nitrogen sources release quickly in hot weather and almost not at all in cold weather.

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SOIL MOISTURE – 60% TEMPERATURE – 80°

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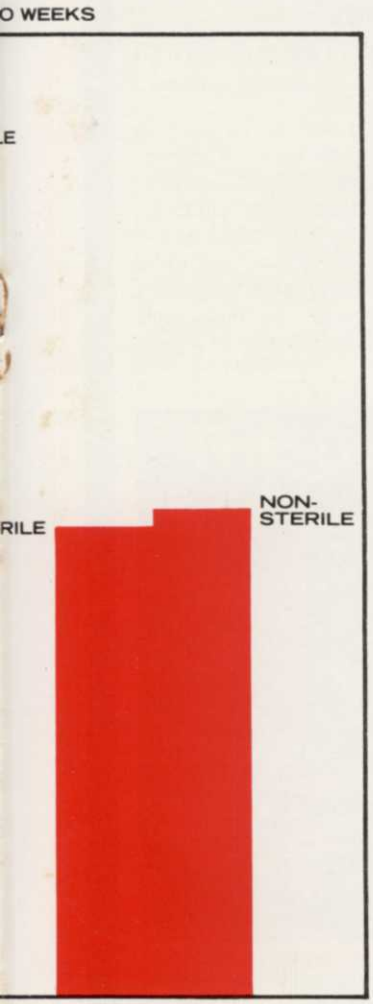

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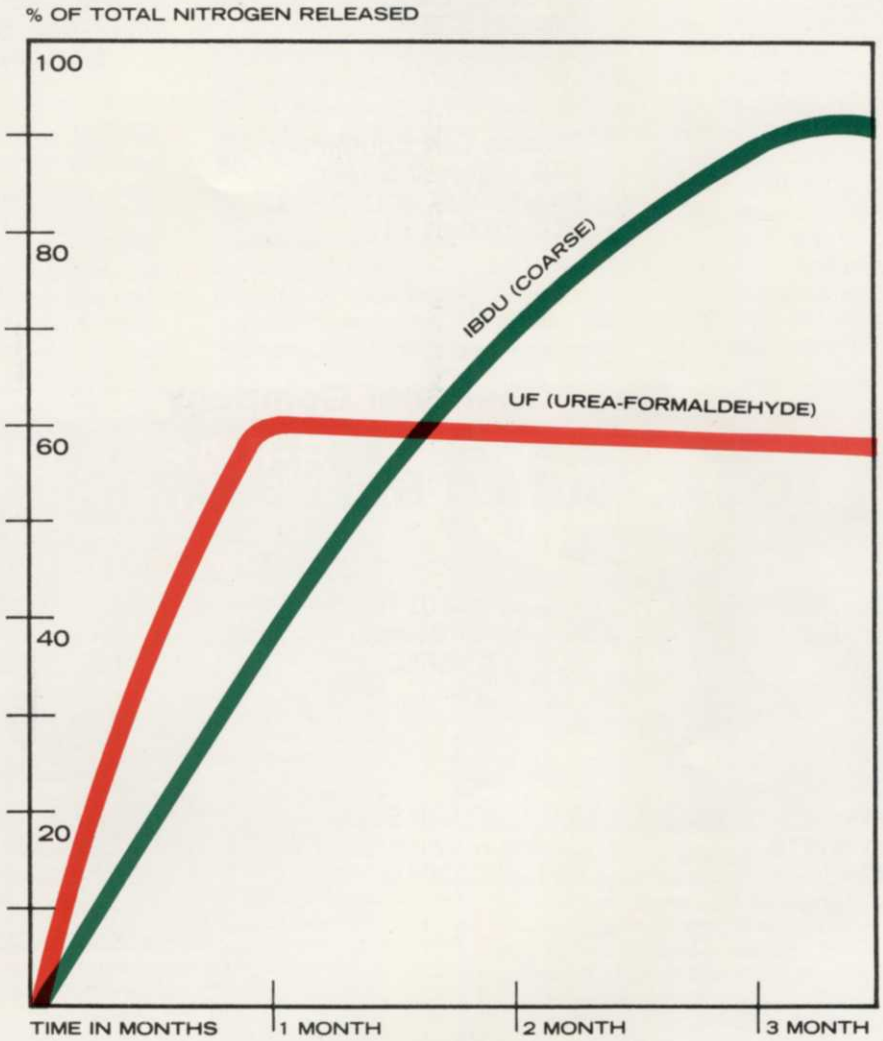
NITROGEN RELEASE RATES
IBDU VS. UREA-FORMALDEHYDE



SOIL MOISTURE – 60% TEMPERATURE – 80°F.

The above chart shows the result of more even release rates. IBDU, since it depends primarily on normal soil moisture and its own particle size, releases longer and more evenly than UF nitrogens.

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The flexibility of PPC means the pipe could easily bend around greens on King's Grant Golf Course.

This is the plan of the system, says John Schmidt (r) owner of Schmidt Irrigation Systtem Installation Co. Other in the group are: (1-r) James Williams, hydraulic project engineer; Matt Ledwith, irrigation consultant; and Mike Kihn, landscape architect.

IN HIS MAJESTY'S HONOR

(from page 44)

as long as 40 feet could be handled manually. And because of its non-brittle nature, breakage costs were virtually non-existent.

The flexibility of PVC meant that installers were able to make the piping system conform to the configuration of each hole with ease. "Look at the bends we make around all the greens," says Schmidt pointing to the pipe contouring around the course, "and if we have to, we can cut a section in a few seconds with a handsaw."

Two types of joining systems were used, solvent weld and gasketed couplings. Both permitted sections in whatever length to be joined in minutes by two men.

From a service standpoint, adds Williams, PVC also performs well. The pipe won't crack or break due to shifting, settling soil, and its life-span is assured by its resistance to corrosion.

King's Grant is nearly complete, with seeding to be finished before the winter months approach. It's expected the course will be ready for play before the first of 3500 housing units are occupied. And the color, thanks to an efficient irrigation system, will definitely be green.

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For More Details on Preceding Page Circle (101) on Reply Card

NEMATODE CONTROL

(from page 24)

greens? Russell calculates it this way. Green fumigation is made by square footage. Average charge is between $6 and $7 per 1000 square feet for material and application. That's for the complete job. Average cost then is about $35 per green.

The irregular areas of most golf greens are hard to measure accurately. Russell came up with the idea of mounting a surveyors measuring wheel on the injection rig. "When the shanks are inserted, the wheel engages the surface of the turf and accurately records the linear feet of injection," he says. "This makes it a simple job to calculate the square footage and cost per green."

There's an added advantage to this method of measuring that has become a hit with superintendents. "Most of them are keeping these accurate area figures for each green as future reference in calculating rates for fertilizer and environmental protection chemicals," he says.

Accuracy of rate is of prime importance in doing a good job of fumigation. For this reason, Soil Fumigants Company have installed a pump and constant pressure on the system to insure a uniform and accurate delivery. Pump pressure with controlled psi is employed on both the small greens rig and the larger fairway machine. Rate is regulated by ground speed, adjusted pressure and orifice size on the shank outlet.

After three years experience with the fairway fumigation and two years with treating greens, the Russells offer these tips for nematode control in the Gulf States: The best nematode control maintenance program should be annual treatment of greens, tees and other high maintenance areas. For fairways and other low maintenance turfgrass, treatment should be scheduled every two years.

"This gives preventive nematode control that should eliminate at least 95 percent of the turf problems," says John Russell. "Further north, where colder winters are the rule, the turf nematode problem is not as serious. I feel the problem should be dealt with as it arises."

Should a superintendent consider building equipment and doing his own treating? Or should he rely on custom applicators such as Soil Fumigants Company? Jack Russell strongly believes that there are real advantages for having the job done by the applicator. There is the initial high investment in equipment, about $12,000 for a large fairway rig or roughly $7000 for the smaller greens unit. In addition, there is the necessity of learning how to apply the nematicide. An experienced custom applicator has this training and the people to do the job professionally the first time.

"Let's not forget about the environment," cautions Russell. "With the increased emphasis being placed on protection of wildlife, fish and man, it is becoming important to know what the label on the product says, but also how to use the material to the best advantage without infringing on the surrounding environment.

"We've found that with this method we can apply much lower rates of Nemagon and minimize surface runoff. Contact with the chemical is reduced to a negligible degree," he continues. "We feel that we're using one of the safest nematicides on the market, particularly when injected at the recommended rate of 20 to 35 pounds per acre."

What about the future? Says Jack Russell: "No doubt new and improved chemicals for turf nematode control will be developed. Better equipment to simplify application even more will enter the picture. But we believe that until these improvements are available and proven, our two applicators units are giving us the best possible results."

Results is what counts. Vigorous turfgrass free of thin and bare spots is what Soil Fumigants Company is after. And at the rate business is coming in, you'd think there was a reward posted for nematodes!□

Scotts Poa Anna Control Plus Fertilizer Available

ProTurf Division of O. M. Scott & Sons has introduced a new product specifically developed for the needs of Southern and Western golf courses and Western golf courses and other turf areas.

Poa Annua Control plus Fertilizer was designed for use on bermudagrass, and selectively kills Poa *annua,* bluegrass, and bentgrass, while providing the bermudagrass with a full feeding of nitrogen and potassium. The product is tailor-made for the elimination of winter overseeded grasses on putting greens. A spring application removes all varieties of grasses that are typically used in overseeding mixtures and thus provides a smooth transition to bermudagrass.

The product is dry-applied, granular, odorless, non-burning and dust-free. Primarily designed to be used on bermudagrass greens, tees, and fairways, it will effectively eliminate established Poa *annua* or winter grasses in three to five weeks, used at double rate in spring or any time these grasses appear.

For additional information write George Horn, ProTurf Division, O. M. Scott & Sons, Marysville, Ohio 43040.

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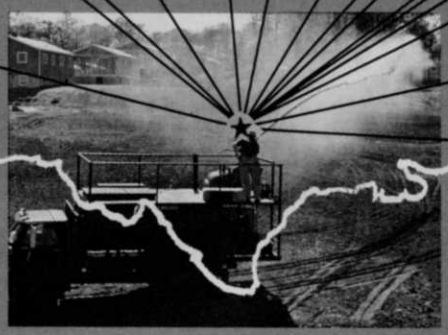

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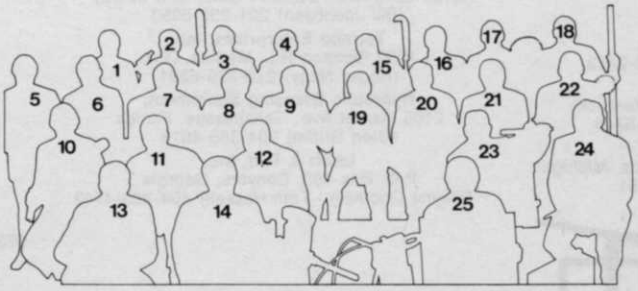

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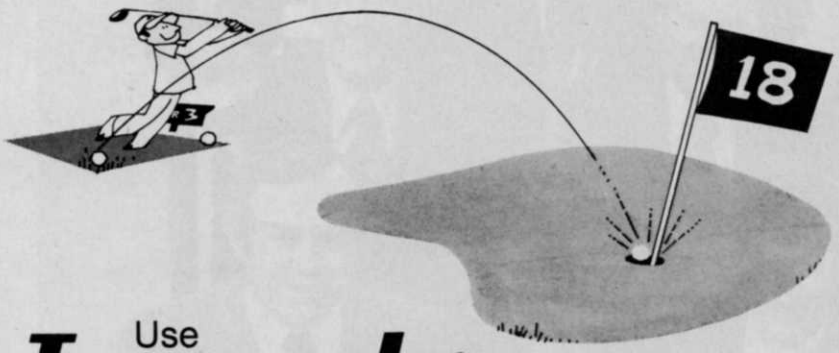

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Graduate Students Win Honors At SWSS

Eight graduate students at five land-grant institutions were recognized for excellence in weed science reseach at the 27th annual Southern Weed Science Society meeting in January.

The recognition, certificates and total of $240 in checks are a part of the Society's student interest project.

Taking top place was the University of Arkansas, with two first-place winners of $50 checks. The students were W. M. Lambert and B. C. Troutman. Their respective research papers dealt with weed competition in soybeans and post-emergence weed control in dormant Bermudagrass.

C. H. Slack of the University of Kentucky was the third top winner. He had placed second in the 1973 competition and works at the University of Kentucky as a research agronomist.

Two Louisiana State University graduate students, R. M. Carter and J. L. Killmer, were runners-up, receiving $30 checks each for their papers dealing with controlling rhizomes (Johnsongrass) and the behavior of herbicides in plants and soils.

The third runner-up was J. W. Jackson of the University of Tennessee.

Honorable mentions were awarded to C. M. French of Oklahoma State University and T. R. Harger of the University of Kentucky.

New Utility Vehicle Coming From Toro

A low-cost utility vehicle, that combines a sleek appearance with rugged construction and features large-load capacity and simplicity of operation, will be introduced by The Toro Company during 1974.

Called the Workmaster, it has a propulsion system that features a variable hydrostatic transmission coupled to an automotive-type differential.

The unit is in limited production and will be available late this fall.

The Workmaster has a load capacity of 1,000 pounds, a maximum speed of 11 mph, full spring suspension on all three wheels, low center of gravity and, to improve hill-climbing ability and sidehill stability, oversized rear tires. It is powered by a 14 hp, 4-cycle air-cooled engine and has a 12-volt electrical system.

For more dtails, circle (719) on the reply card.

U. S. Forest Service Permits Issued

Since the nation is involved in a serious energy crisis, the Federal government has opened U.S. Forest Service lands to make firewood available for fuel. This decision is in effect now on a national basis, however specific woodcutting instructions vary from forest to forest.

Says a spokesman for the U. S. Forest Service, "Firewood cutting permits are being issued to individuals for home fuel wood use only. These free use permits are available at each ranger district office, and we recommend that they be contacted for information pertaining to your specific area."

FMC Builds Plant in Aiken, S.C.

FMC Corporation's Outdoor Power Equipment Division announced plans to build an 80,000 sq. ft. manufacturing plant in Aiken, SC, to manufacture Bolens mulching lawn mowers, snow throwers and other walk-behind lawn and garden products. Negotiations are underway with Aiken city officials to purchase a site for the plant.

Training Courses From OSHA

Two job safety and health training packages — one designed to help employers evaluate their own operations and the other aimed at reducing the number of injuries resulting from cave-ins—are now available, OSHA announced.

OSHA noted that even though many of its training activities are primarily for its own compliance officers, it is preparing much material for the private sector.

One package, "A Guide to Voluntary Compliance," consists of the same materials used in the 40-hour course taught at OSHA's Training Institute near Chicago. Containing a student manual, instructor's guide, and a set of 174 color slides, it provides guidelines for developing systematic self-inspection procedures to help employers correct workplace deficiencies. It is priced at $55 per set.

The other package, entitled "Safety and Health in Excavation and Trenching Operations," is a special emphasis instructional program aimed at reducing the number of injuries and fatalities from cave-ins at construction sites.

It stresses the importance of soil support, especially shoring, in offsetting the hazards in excavation and trenching operations. Available for $21, the set includes an instructional manual, a resource supplement and set of 139 color slides.

Both courses, produced in narrative script style with slides cued in, may be purchased from the National Audiovisual Center, General Services Administration, Washington, D. C. 20409.

Golf Foundation Meets— Energy Crisis on Agenda

The nation's golf courses must prepare for one of their busiest years in 1974 to meet the demands of activity spurred by the energy crisis, says National Golf Foundation Executive Director Don A. Rossi in summing up the Foundation's four day winter staff meeting in Chicago earlier this month.

The current restriction on American's great mobility in seeking their relaxation and recreation will crowd the nation's more than 11,000 golf courses as players remain closer to home to conserve fuel, he said.

This was the theme expressed at a four day meeting of the foundation by guest speakers too. They represented the major areas of golf. Their message: to alert the golf world to expected record player traffic and its demands for products and services related to golf. The speakers included Executive Director Mark Cox of the Professional Golfers Association of America, Executive Director Ken Emerson of the National Club Association, and Dr. James Watson, vice-president for customer relations of The Toro Company.

Rossi declared that the National Golf Foundation, as the national clearinghouse of golf information, is better able than ever before to meet the challenge of the year ahead with the largest and best equipped staff of Golf Facility Development Consultants in its history.

The semi-annual meeting, was programmed to review consultant activities and case histories of the half-year just past in order to achieve greater efficiency and effectiveness in aiding golf facility development. It also served as a forum for the presentation of papers by individual consultants on areas of special interest to the golf industry.

Chain Saws Hot Property, Says Echo Marketing Boss

The nation's energy shortage has turned chain saws into hot property, according to Donald A. Bartelt, general sales manager of the Echo Chain Saw Division of the Kioritz Corp. of America.

"The effects of the energy shortage and the resultant fuel-saving measures have placed tremendous demands on the chain saw industry," Bartelt says. "The demand for saws and related wood-harvesting equipment surged beyond the industry's capacity to produce and put most saw makers in a backorder situation in the fourth quarter of the year."

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resulted in the evolution of strict environmental criteria in many areas.

Extra Cash From Firewood Helps Tree Care Firms

If you're faced with a takedown, don't look to the chipper as the only means of wood disposal.

Many professional tree care firms are capitalizing on the "energy crisis" by selling the wood from takedowns as firewood.

Howard L. Eckel, vice president of Davey Tree Expert Co., Kent, Ohio, offers these suggestions about selling firewood as part of your business:

- Most customers want firewood that's dry and well-seasoned. Hickory, oak, maple, beech and most fruit tree woods burn best. Softwoods, such as pine, fir, spruce and cedar are filled with sap and resins. They burn too fast and work better as chips for mulching.
- If the homeowner wants the wood, stack it criss-cross so the air can get at it. When logs are stacked in rows, air circulation is greatly reduced and they retain moisture and do not age properly.
- Cords and ricks are the standard measure in wood selling. A cord is 4 ft. x 4 ft. x 8 ft. or 128 cu. ft. A rick is usually 4 ft. x 8 ft. but only as deep as the length of the logs—16, 18 or 24 in. Stack your wood in a prominent place so the customer sees it.
- From a business standpoint, collect the money at the time of delivery. It saves in collection energy.

Sod Service School Held By Century Toro

An information/education session for sod growers was held in Dayton, Ohio by Century Toro Distributers in late January.

The innovative sod service school, attracted 41 persons representing growers from Cincinnati, Dayton and Columbus, according to Harry Murray.

Speakers at the one-day affair include: Jon Hering, field service representative of Briggs and Straton Corp., Frank Busdini, Toro Co., Jim Lyne, field service representative for Ryan Equipment Co. and Paul Florence, sod grower from Marysville, Ohio.

Texas Landscape Architects Meet In San Antonio

The Texas Society of Landscape Architects held its winter meeting in San Antonio in January.

At a business session, members were reminded that only a person who has been duly registered under the laws of this state (Texas) shall be permitted to represent himself to be a "Landscape Architect", and that violations should be reported to the Texas State Board of Landscape Architects.

New officers for 1974 are: Robert W. Caldwell, president; Gratz C. Myers, Jr., vice president and John F. Teas, secretary-treasurer.

Washington D. C. Meeting To Discuss Energy

A major national meeting which bringing together leaders from Congress, the administration, business, science, labor, the media, and environmental and consumer groups to explore today's energy choices and tomorrow's alternative sources, will be April 24 and 25 at the Washington Hilton Hotel, Washington, D.C.

Sponsored by the World Future Society, the meeting, "Energy: Today's Choices, Tomorrow's Opportunities," will seek long-term solutions to the energy problem by focusing on: the underlying causes of the current energy crisis, the availability and applicability of alternative sources of energy, global strategies necessary to fulfill the energy needs of all nations, and individual and institutional adaptation to more appropriate utilization of energy.

Among the scheduled speakers will be Congressman Mike McCormack, the only scientist in the U.S. House of Representatives; Leonard Woodcock, President of the United Automobile Workers; Commissioner William O. Doub of the U.S. Atomic Energy Commission and Glenn T. Seaborg, former AEC Chairman; Carl Madden, Chief Economist of the U.S. Chamber of Commerce; Jack Conway, President of Common Cause; Beatrice Willard, member of the Council on Environmental Quality; Orville Freeman, former Secretary of Agriculture; W. Donham Crawford, President of the Edison Electric Institute; and many others.

Admission information, registration forms and advance reservations are available from the World Future Society, 4916 St. Elmo Avenue, Washington, D.C. 20014, telephone (301) 656-8274.

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DISEASE CONTROL

(from page 10)

thiram, maneb, zineb, Dynene, Actidone and Daconil have broad activity spectra. Even though they were more effective against some pathogens then others, the materials still were toxic to a wide range of disease organisms. Neither fungicide choice nor disease diagnosis was critical. If the superintendent mis-diagnosed his fungicide choice it was still more or less effective and nothing drastic happened.

The advent of the new systemics changed all that. The benzimidazole (Tersan 1991) compounds are extremely effective against *Sclerotinia* dollarspot and worthless against *Pithium* blight. Attempting control of *Pithium* blight mis-diagnosed as dollarspot with lots of visible white mycelium would be pure disaster.

These or similar types of crises happened far too often this past summer. In one instance with which we were familiar, greens received four applications of different fungicides in one week, all at maximum label dosage. At the end of the week, the greens were yellow, partially scorched and diagnosis of the original problem would have taken the wisdom of 16 Solomons. The cure was indeed worse than the ailment.

Successful disease control is built on good planning and taking advantage of accumulated experience. Cultural mangement comes first, chemical fungicides second. For greens especially, a good, deep, vigorous root system is essential. Disease damage to a bentgrass green surviving on ¼ inch of root depth clinging to bricklike compacted soil will be far worse than on a deep rooted healthy turf. Far too many people are substituting the chemical pill for spring and fall aerification, monthly topdressing, and light verticutting at regular intervals. Topdressing plays a big roll in decaying surface debris and thatch; thus, minimizing the survival base for disease organisms.

Various fungicide programs can be used to accomplish the same goal. Experience plays a big part in fungicide choice and successful use. New fungicides should be introduced gradually, first in the nursery, then on a green or fairway, and finally incorporated into the total program. This may take an entire season or several seasons to accomplish.

There are no miracle fungicides. Often what is gained towards one disease is lost in another. The replacement of mercury with benzimidazoles (systemics) in a fungicide program gains better dollarspot and brown patch control but loses all *Helminthosporium* and *Pythium* suppression, thus requiring additional different fungicides integrated at appropriate intervals.

Last, successful control requires accurate disease diagnosis and estimation of problem severity. Is the disease truly going to result in severe turf loss or is it merely a curiosity? Will it get better in a week whether you spray or not? With rising costs everywhere the turf manager must make hard decisions. Treatment costs must be viewed in terms of real benefits, not imagined or whimsical improvement.

Reprinted from THE KEYNOTER, a publication of the Pennsylvania Turfgrass Council, Inc.

Fine Fescues Right For Roadside Uses

Fine fescues are important components of grass mixtures to use for keeping roadsides green and beautiful with a minimum of maintenance, according to Dr. Robert W. Duell of Rutgers University.

"Research has shown that several of the fine fescues thrive in acid soils, such as are frequently found along roadsides where there is less opportunity to correct soil acidity with applications of lime," he said.

An associate research professor in the department of soils and crops at Cook College, New Brunswick, N.J., Dr. Duell reported the result of his research on turfgrass varieties and soil acidity to the American Society of Agronomy.

The field work involved the development of different levels of acidity in field plots through 4 years of surface applications of ammonium nitrate and lime.

Once the desired acid levels were reached, 19 varieties of grasses and legumes were sown in the plots. All plants tested, except the fine fescues, did best in the less acid soils that had had lime treatments. The fine fescues, however, did better in the more acid soils of the research area.

In addition to the paper, Dr. Duell is senior author of a monograph and slide series, sponsored by the Turfgrass Division of the ASA, which he previewed at the meeting. The slides portray the problems, materials, and methods involved in the development of a superior vegetative cover for roadsides and will be available through the ASA.

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This is why! MERION has proven itself time and time again. MERION is sturdy, thick, deep rooted, dark green the summer through. Needs less work, less water, and resists weed invasion. MERION mixes well with other grasses too. So why switch!

MERION IS NUMBER ONE.

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MERION BLUEGRASS ASSOCIATION
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ASK A JARI OWNER!

He will tell you the self-propelled Jari Sickle Mower starts where other mowers leave off. Cuts grass, weeds and brush up to 1 3/8" thick. It's designed to take rocks, wire and other foreign objects in stride without danger to the operator, bystanders or the machine.

Floating sickle bars ranging from 16" - 60" makes Jari ideal for:

Orchards, Hillsides, Acreages, Fencelines, Ditches, Windbreaks, Lanes, Waterways, Around Gardens & Buildings

For more information contact:

JARI DIVISION
Dept. 3, Box 2075
Mankato, Minn. 56001

industry people on the move

MARGARET HERBST, appointed executive secretary of the New York State Arborists Association.

* * *

ROBERT HINDES, joins Thompson-Hayward Chemical Company as an agricultural sales representative. He will be working in the Yakima, Wash. area.

* * *

WILLIAM J. WILKINSON, appointed manager, materials management for the agricultural and veterinary products division of Abbott Laboratories.

* * *

HERBERT A. JESPERSEN, named assistant division manager of OMC-Lincoln, a division of Outboard Marine Corporation. He has been chief engineer of Lawn-Boy.

* * *

GEORGE MOORE, appointed assistant sales director of Municipal & Industrial Service equipment Division of FMC Corp. Before joining FMC, Moore was general manager of Bridgestone Tire Co.

* * *

CLIFF BURD, joins the staff of Thompson-Hayward Chemical Co. as an agricultural sales representative. His territory will include central Texas.

* * *

DANIEL WEIGEL, joins the Outdoor Power Equipment Division of FMC Corp. in Port Washington, Wis. as personnel manager. He will be responsible for the division's personnel administration and employee relations.

* * *

S.E. (STU) AINSWORTH, appoined manager of agricultural chemicals for Abbott Laboratories.

* * *

ROBERT L. HUTCHINGS, named manager-marketing services and **DENZLE Q. WHITEHAIR,** appointed manager-field sales of Hays Mfg., a division of Zurn Industries, Inc.

* * *

JAMES R. ELY and **GEORGE HARRISON,** merged the activities of A-1 Spray Service and James R. Ely Horticulture Consulting and Spraying. The Washington firm will be Ely-Harrison Enterprizes, Inc., doing business as A-1 Spray Service and Horticultural Consulting.

* * *

CLAUDE CRUSE, becomes executive secretary for the Weed Science Society of America (WSSA). He will handle most of the duties formerly assigned to **DR. FRED SLIFE,** previous exec. sec.

* * *

DR. JOHN E. KAUFMANN, appointed assistant professor of turfgrass management for Cornell University. He fills the position vacated by Professor Emeritus **JOHN F. CORNMAN.**

* * *

DR. MICHAEL TYSOWSKY, named entomologist for the agricultural chemicals division of ICI America, Inc. **DR. DAVID H. BROOKS,** appointed research supervisor. He is on a two-year leave from the London based parent company.

* * *

EDGAR E. FEHNEL to vice president of agricultural marketing planning for Elanco Products Company. He will be responsible for products planning and coordination of agricultural products on a worldwide basis.

For More Details Circle (131) on Reply Card

Dacthal® drives 20 annual weeds off the course with one easy swing.

One application early in the spring. That's all it takes. Dacthal preemergence herbicide prevents 20 annual weeds from sprouting all season long. Problem weeds like carpetweed, chickweed, purslane and others. So you can devote time and manpower to more important work.

Dacthal doesn't stop there. It also drives out troublesome crabgrass and *Poa annua*. Hit 'em in the spring. And follow through with Dacthal in late summer for control of *Poa annua* and other late-germinating weeds.

Over the years, Dacthal has proven to be the closest thing to worry-free weed control. It won't harm new grass when used as directed. Won't leach out with frequent waterings. And there's no problem of residue buildup in the soil.

Dacthal degrades, naturally, in one season. Just read and follow label directions.

You can even use Dacthal to keep the weeds out of flowers and shrubs. It's cleared for use on over 120 ornamentals. That's one more beauty of it.

This year, drive out weeds with Dacthal... the all-around favorite preemergence herbicide. Available in wettable powder or granules. Ask your supplier for more information or write: Agricultural Chemicals Division, Diamond Shamrock Chemical Company, 1100 Superior Avenue, Cleveland OH 44114.

TOTAL TURF CARE

Diamond Shamrock Chemical Company

A UNIT OF DIAMOND SHAMROCK CORPORATION

For More Details Circle (117) on Reply Card

Help Engines Start Easier In Cold Weather

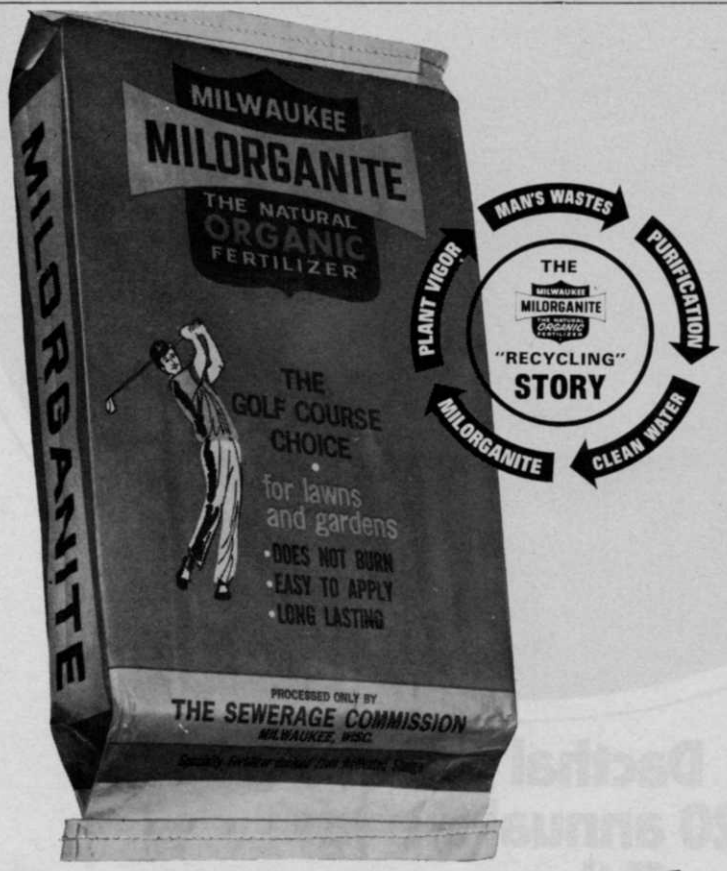
Hard to start trucks or tractors, can be a real aggravation during winter months. There are several things you can do, though, to prevent this irritation, and doing them early in winter can make the next few months a lot more pleasant.

Three main problems cause winter starting problems with gasoline engines, according to Sam Huber, extension agricultural engineer at Ohio State University. Fuel doesn't vaporize as readily at low temperatures, making it more difficult to obtain a mixture of air and fuel that will burn. Electric spark at the spark plugs may not be intense enough to ignite the air-fuel mixture, because of lower output of the battery at low temperatures. Cold oil in the crankcase causes the engine to crank harder, thus requiring more battery power.

Huber's suggestions for overcoming starting difficulties with gasoline engines includes having each engine tuned up by installing new spark plugs, breaker points and condenser, and by checking wiring, the air cleaner, and operation of the choke.

Have batteries tested to be sure they are fully charged. Battery capacity drops from 100 percent at 80 degrees to 68 percent at 32 degrees, 46 percent at 0 degrees, and 30 percent at -20 degrees. The power required for cranking an engine increases from 100 percent at 80 degrees to 165 percent at 32, 250 percent at 0, and to 350 percent at -20, Huber points out.

With diesel engines, it's difficult to raise the temperature of the compressed air to the required ignition temperature of the fuel. To remedy this, the engineer suggests checking the batteries, using electric heating built-in starting aids, using ether starting fluid, and using a higher octane number fuel if necessary.



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Everything's already there — naturally!

THE SEWERAGE COMMISSION P. O. BOX 2079 • MILWAUKEE, WISCONSIN 53201

National Arbor Day Support Sought By Harry Banker

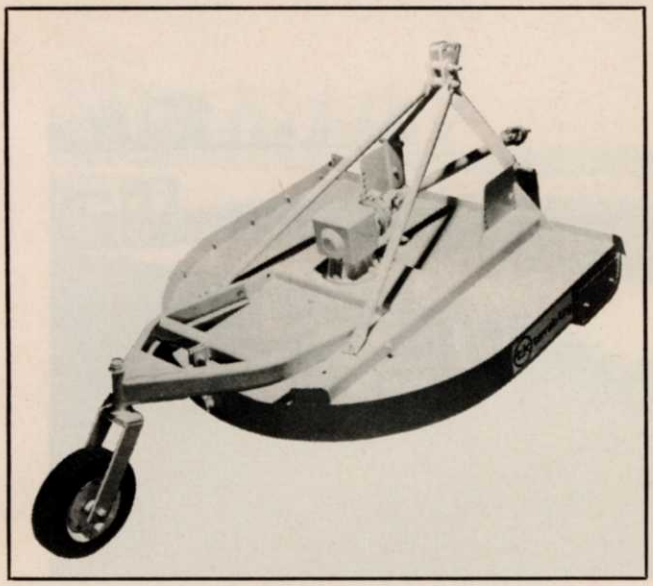
The executive secretary of the National Arbor Day Committee has urged members of the International Shade Tree Conference and more than 35 state chairmen of the Nat. Arbor Day committee to seek legislative support of the day.

Harry J. Banker has solicited help from the Green Industry to urge legislators to suport passage of the National Arbor Day bills, S.J. Res. 162 and H.J. Res. 789. The legislation, introduced by Sen. Harrison A. Williams (Dem-N.J.) and Con. Joseph G. Minish (Dem-N.J.), would authorize the President to proclaim the last Friday in April 1974 as National Arbor Day.

Many trees are still disappearing at an alarming rate due to the continued expansion of highway systems as well as the industrial and commercial building growth in our spreading suburban sprawl, says Banker. This decimation of our trees, coupled with additional heavy losses inflicted by gypsy moths, various diseases, forest fires, etc. runs our annual tree losses into the millions. Only fractional amounts of replacements are taking place.

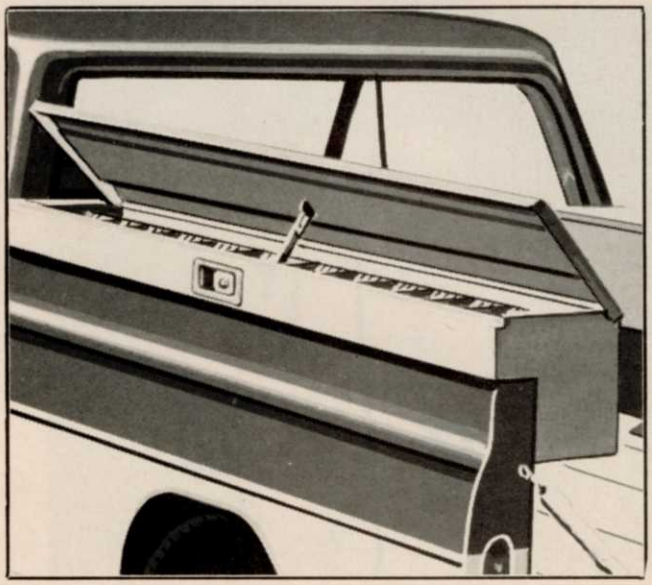
Banker says the passage of the National Arbor Day measures provide a much needed method for awakening the nation to these alarming statistics. It could precipitate the appropriation of necessary funds and it would also encourage private citizens to gain a better appreciation of trees on their properties, he believes.

For More Details Circle (125) on Reply Card



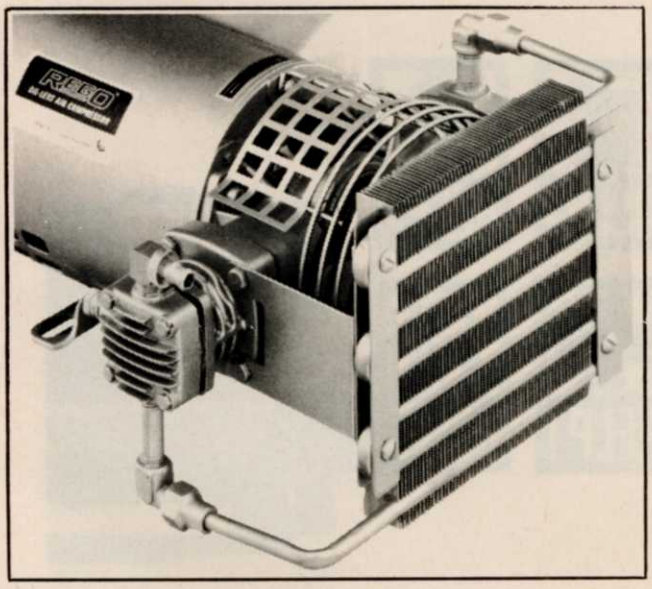
HEAVY DUTY CUTTERS: Terrain Corp., Houston, Texas

This series of cutters in 5 ft., 6 ft. and 7 ft. models, is designed for extreme cutting conditions, including the capacity of cutting 6 inch diameter saplings. The cutter deck features a rugged "A" frame and tubular-type construction design to give the unit greater strength and longer service life. It is also available in 3-point lift and pull type models. The list of standard equipment includes: round blade holder with blades, 4:00x8 tail wheel on the 3 point lift model, slip clutch, drive shaft with 35R series U-joints and replaceable skid shoes. For more details, circle (701) on the reply card.



"SIDE-MATE" STORAGE BOX: Reading Body Works, Inc., Reading, Pa.

These inverted L-shaped boxes are designed for attachment with the shallow portion atop the sidewall of the truck and the deeper portion extending downward onto the truckbed above the rear wheel housings. The mounted boxes give the driver maximum rear visibility and provide easy access to contents. Designed to fit all popular domestic pickup trucks, they come in lengths of 48 in., 60 in. and 88 in. Each box has a front parts tray with removable dividers, adjustable on one inch centers. The top-opening doors are equipped with flush-mounted, slam-action, key-locking, paddle type locks, zinc coated for rust-free action. For more details, circle (702) on the reply card.

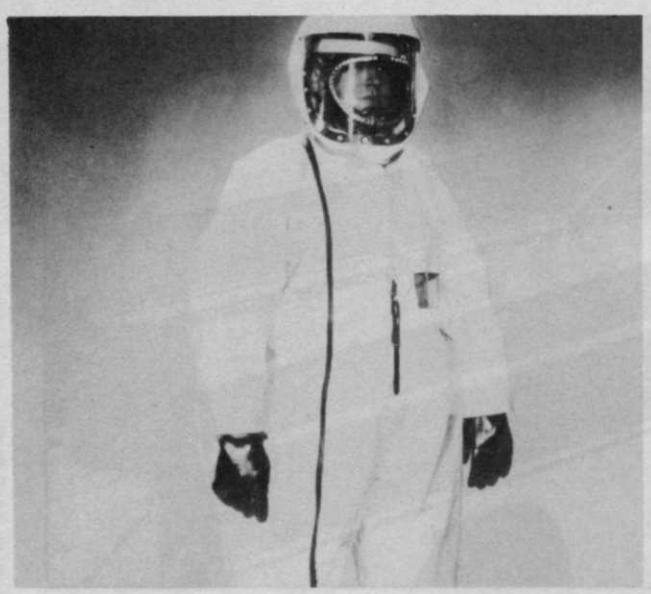


HIGH PRESSURE, OIL-FREE AIR COMPRESSOR: Rego Div. of Golconda Corp., Chicago, Ill.

This two-stage compressor is suitable for up to 200 psi continuous operation and is available in five sizes: ⅓, ½, ¾, 1 and 1½ hp. All compressors feature stainless steel sandwich type valves, Teflon fitted piston, adjustable cylinders and all parts under pressure are non-ferrous. All two-stage units are equipped with a fintype Intercooler to reduce the heat of compression between stages. Single and three electric motors are available in all standard voltages. For more details, circle (703) on the reply card.

HIGH PRESSURE WASHER: Allis-Chalmers Corp., Milwaukee, Wis.

The largest of two high pressure washers is the Model 803. This unit delivers 800 psi at 3 gpm with water provided by a 1.5 hp 115 volt electric motor. A 35 ft. hose is encased along with external wiring in a single, plastic sleeve for strength, ease of operation and easier maintence. Hose diameter is 5/16 in. Features include two standard nozzles, a standard heat resistant wand grip, dual water inlets, two five gallon plastic containers and snap-on hydraulic coupling for quick and easy installation and removal of hose, wand and nozzles. For more details, circle (704) on the reply card.

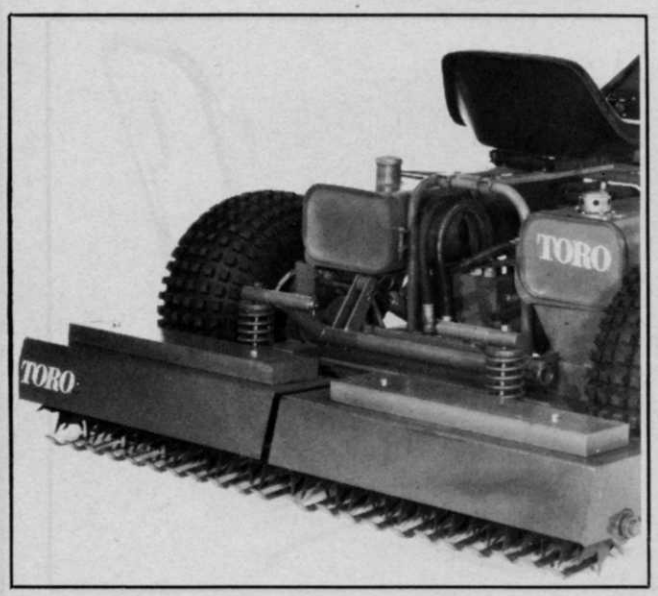


JOMAC COVERALL SHIELDS: Jomac Products, Inc., Warrington, Pa.

The look of the future? Maybe. This head-to-toe suit is designed for people who work in hazardous areas and atmospheres. The air-impermeable sealed seam construction of these PVC-coated (polyvinyl chloride) coveralls protects against chemical splash, hazardous vapors and noxious fumes. A working atmosphere is supplied by an air pack contained in a built-in pouch in the coverall back. A backup system provides air supplied through hoses attached to a manifold inside the suit. For more details, circle (705) on the reply card.

"GOOSENECK" FLATBED TRAILER: Schuster-Gooseneck Division of R.A.M., Inc., Des Moines, Iowa.

This high-capacity flatbed trailer uses the "5th wheel" principle for the load and maneuverability advantages of a semi-trailer when pulled by a pickup truck or a tractor. Steel or wood decks are available on two or three axle models with such standard features as mud flaps, electric brakes, heavy duty brake control, ICC lights and reflectors, break-away switch, etc. A handy item for hauling sod or spraying equipment. For more details, circle (706) on the reply card.

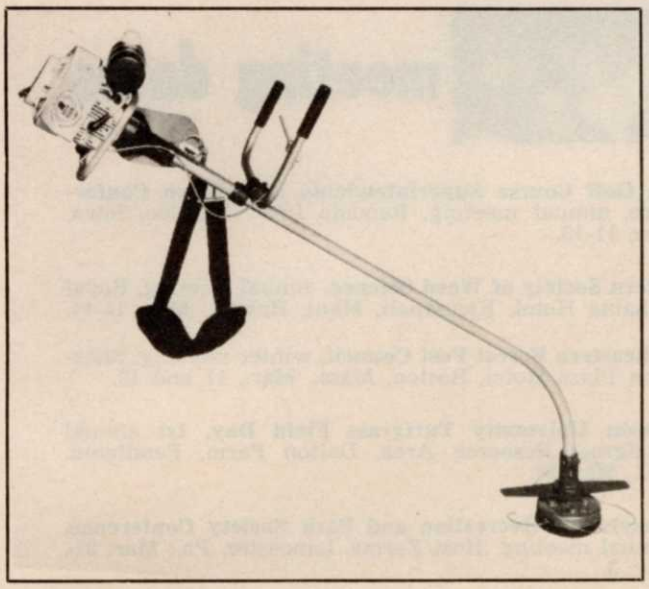


GREENS SPIKER: The Toro Company, Minneapolis, Minn.

A new assessory for the Sand Pro is this special profile-tooth blade. It spikes cleanly without ruffling the soil because "hold-down fingers" prevent lifting of the turf. Greens are immediately playable after spiking, with no rolling or cutting needed. A transfer spring puts up to 22 lbs./blade across the width of the 58 in. spiking reel to assure maximum 1¼ penetration. For more details, circle (707) on the reply card.

AUTO DISTRESS FLAGS: Beauchamp Company Safety Products, Bronx, N.Y.

Out of gas? Put out one of these four flags to alert passing motorists. They utilize four visual signs to indicate the type of aid needed: out of gas, flat tire, mechanical failure or injury. Red, white and blue colors are used to achieve maximum visibility. Each flag measures 16 inches x 24 inches. Flags fold flat and compact for handy storage in glove compartment, console or trunk. For more details, circle (708) on the reply card.

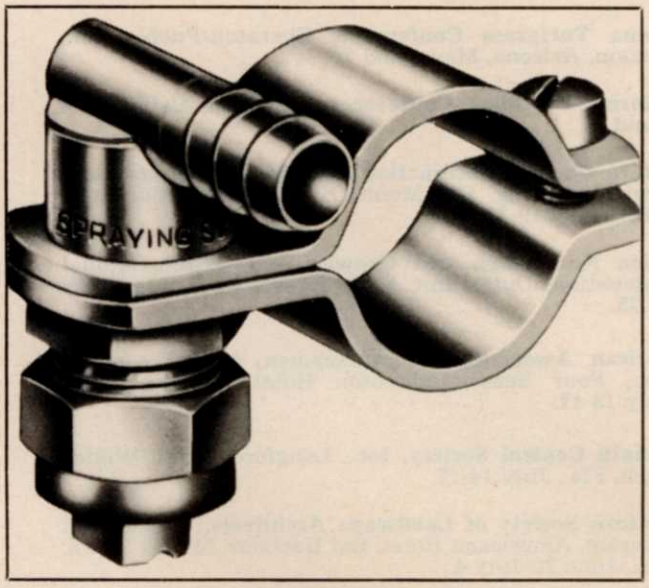


"WEED EATER": Weed Eaters, Inc., Houston, Texas

No more missing toes with this brush cutter. The revolutionary safety feature is the machines' cutting blade, which is made of heavy duty 'fishing line'. The monofilament nylon cord is a 200 lb. test line, specially treated to withstand high impact. The whirling blades of nylon, cut through weeds and grass bouncing off hidden bottles, cans, rocks and even the operator's own feet without harm. It cuts quickly and easily along fences, culverts, rock gardens, walls, ditches and other applications normally associated with slow, tedious work. For more details, circle (709) on the reply card.

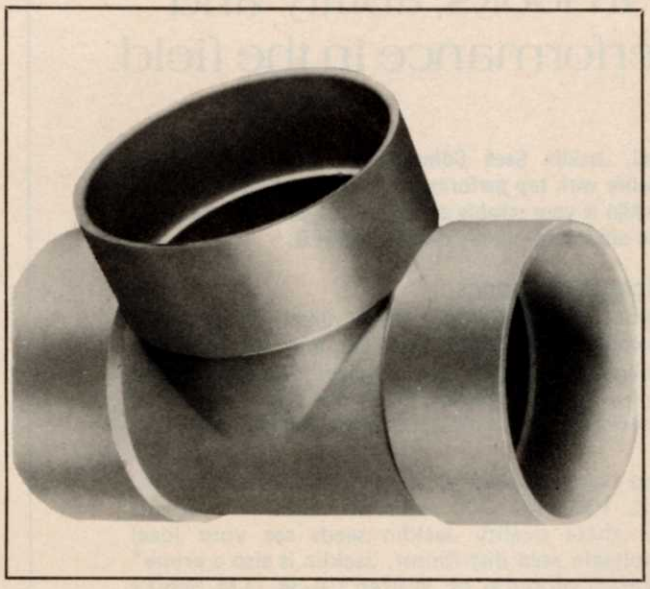
DU-WIPER: Ginther Equipment Corp., Arcadia, Calif.

Put the garden hose away boys. This new wiper removes dew from golf greens quickly in 6 ft. passes. It weighs 25 lbs. and the rubber-tired wheels are equipped with anti-friction bearings requiring very little effort. A special wiper loosens the dew enabling it to soak into the soil. For more details, circle (710) on the reply card.



"FREE FLOW" TEEJET VARI-SPACING NOZZLES: Spraying Systems Co., Wheaton, Ill.

This series of brass nozzles feature an inlet with extra large internal passages. The complete assembly consists of brass nozzle body in a choice of single or double hose connections, brass cap and zinc plated steel clamp. They come in sizes to fit ⅜ in. ½ in. and 1 in. ID hose. For more details, circle (711) on the reply card.



DOMESTIC SANITATION FITTINGS: R & G Sloane Co., Woodland Hills, Calif.

A welcome addition to the domestic sanitation market are these 4 in. and 6 in. water main fittings. Specifically designed to counteract the threat of water pollutants, the new corrosive resistant fittings conform to ASTM Material Specs. D2729, D3033 and D3034. The fittings consist of the following components: tees, wyes, elbows, coupling, reducer bushings, caps, adapters, etc. For more details, circle (712) on the reply card.

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in looks, ability and performance in the field.

And, Jacklin Seed Company built its reputation for quality with top performance in the field year after year. Jacklin is your reliable answer to seed performance. When you order seed, specify JACKLIN SEED.

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Merion, 0217® Fylking, Glade, Cheri, Nugget, S-21, Newport, Delta, Geary, Park, Six, and Troy Kentucky bluegrass; Rathdrum and Reubens Canada bluegrass; Norlea Perennial ryegrass, Public and private varieties of Creeping Red, Nova rubra, Chewings, and Hard fescues.

And has produced on a contract basis: Pennfine, N.K. 100, N.K. 200 and Pelo Perennial ryegrass. For these quality Jacklin seeds see your local wholesale seed distributor. Jacklin is also a prime* contract producer of: Warren's A-34, O.M. Scott's Windsor and Adelphi Kentucky bluegrass.
Jacklin has built a reputation of fine quality and service for over 30 years. You can count on purity of content, high quality and sure germination.

*Available only through breeder and owner outlets.

Jacklin® Seed Company

Division of the Vaughan-Jacklin Corporation

meeting dates

Iowa Golf Course Superintendents Association Conference, annual meeting, Ramada Inn, Waterloo, Iowa, Mar. 11-13.

Western Society of Weed Science, annual meeting, Royal Lahaina Hotel, Kaanapali, Maui, Hawaii, Mar. 11-14.

Northeastern Forest Pest Council, winter meeting, Sharaton Plaza Hotel, Boston, Mass., Mar., 11 and 12.

Clemson University Turfgrass Field Day, 1st annual Turfgrass Research Area, Dalton Farm, Pendleton, S.C., Mar. 26.

Pennsylvania Recreation and Park Society Conference, annual meeting, Host Farms, Lancaster, Pa., Mar. 31-Apr. 3.

Canada Chapter, International Shade Tree Conference, annual meeting, International Inn, Winnipeg, Manitoba, Canada, Apr. 3-5.

Williamsburg Garden Symposium, in association with the American Horticultural Society, Williamsburg, Va., Mar. 31-Apr. 5.

National Water Safety Congress, annual meeting, Heart O'Town Motor Inn, Charleston, W. Va., Apr. 21-24.

Southern California Turfgrass and Landscape Horticulture Institute, annual session, Royal Inn, Anaheim, Calif., April 23-24.

Arizona Turfgrass Conference, Sheraton-Pueblo Inn, Tucson, Arizona, May 1 and 2.

California Fertilizer Conference, Aneheim, Calif., May 2 and 3.

Western Chapter, International Shade Tree Conference, annual meeting, Del Monte Hyatt House, Monterey, Calif., May 19-22.

Florida Nurseymen and Growers Association, annual convention, Dutch Inn, Lake Buena Vista, Fla., May 23-25.

American Association of Nurseymen, annual convention, Four Seasons-Sheraton Hotel, Toronto, Ont., July 13-17.

Hyacinth Control Society, Inc., Langford Hotel, Winter Park, Fla., July 14-17.

American Society of Landscape Architects, 74th annual meeting, Americana Hotel, Bal Harbour, Miami Beach, Fla., June 30-July 4.

International Shade Tree Conference, Golden Anniversary meeting, Atlanta, Ga., Aug. 18-23.

Professional Grounds Management Society Conference, annual meeting, Crown Center Hotel, Kansas City, Mo., Sept. 3-7.

International Pesticide Applicators Association, Seattle, Wash., Sept. 18-21.

International Plant Propagators' Society, Western Region, 15th annual meeting, Mission Bay area, San Diego, Calif., Sept. 4-6.

Central Plains Turfgrass Conference, K-State Union, Kansas State University, Manhattan, Kan., Oct. 23-25.

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You'll find Hahn and Ransomes - Hahn earth-care products all over the world. From Brussels to Savannah, you'll see innovative Hahn machines helping men with problems like yours take care of their part of the earth.

Why are more and more people choosing Hahn every year over our fine competition? Well, maybe it's because Hahn has placed its emphasis on developing equipment that saves you money and makes your job a lot easier.

Equipment like our world famous Tournament Triplex Greens Management System that takes care of four back-breaking, time-consuming jobs. Or our self-propelled Flex-a-matic, the most field tested self-propelled gang mower ever introduced.

Hahn manufactures everything from aerifiers to vacuums to power drags to the most sophisticated mowing machines available. In fact, whatever your need in caring for your part of the earth . . . Hahn has an earth-care product that will make your job easier.

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Urban Rise, Second Home Studied By Task Force

Urban areas, which already contain 66 percent of the nation's population, are destined to expand into still more farm acreage despite recent challenges by environmentalists to the pace of development.

That is the forecast of a citizens' task force in a report that offers hope for reconciling some of the deep and growing differences between forces stimulating growth and those of unyielding conservation.

Though the task force, headed by Laurance S. Rockefeller, is critical of "unrestrained, piecemeal urbanization," it recognizes that "the needs of the American population can be met only through continuing development."

The 12-member group found all indicators pointing to a further spread of urban land area. Stimulated by affluence, the pace of land consumption exceeds both the increase in population growth and the rate of household formations, even though within the next 12 years more than 27,000 new households are anticipated every week. That is the equivalent to the weekly creation of a city the size of Green Bay, Wis.

Set up last September by the White House-mandated Citizens' Advisory Committee on Environmental Quality, the task force was sponsored by the Rockefeller Brothers Fund.

Much of the rapid conversion of rural land is caused by the enormous demand of Americans for second or recreational homes, the research team found. It gave these statistics:

"There are now about 2.9 million second or recreational homes in America, up from 1.7 million in 1967. It has been estimated that 95,000 second or resort homes were started in 1971, up from an estimated average of 20,000 per year in the 1940s, 40,000 per year in the 1950s, and 75,000 per year in the 1960s. The estimated annual demand for second homes is expected to reach 200,000 by 1980."

But more significant in terms of inroads into the supply of rural land is a task force finding that "rural lots are being created far faster than second homes. For the nation as a whole at least six recreational lots were sold in 1971 for every second home started."

The task force believes "livable, ecologically sound recreational communities" should be encouraged, but it urged states and local jurisdictions to prevent lot sales where such communities are unlikely to be developed.

Recognizing that the nation's open space needs cannot be met solely with publicly owned land, the task force urges identification of privately owned land that should be preserved in a natural state, including uniquely productive or strategically located farm lands.

It urges, however, that measures that provide tax relief to farms in urbanizing areas be re-examined. The rationale for such measures, in effect in half the states, is that the predictable rise in property taxes in urban fringes tends to "drive the farmer off the land."

The task force believes that such tax relief is justified only when the land assessed in current use is truly worthy of preservation, and is to be conserved permanently in farm use. Tax reductions in the absence of permanent restrictions should be regarded as halfway measures, the group maintains.

The task force is hopeful about changed public attitudes that have

2 sec. quiz:
Which irrigation cover will look better in your turf?

Quiz fast and easy? As easy as installing thermoplastic boxes with our exclusive "ever-green" covers.

That's why thousands are in use today coast-to-coast. Bought for their benefits. Blending beautifully with their turf.

Take the next easy step. Write today for complete details to AMETEK, Plymouth Plastics Division, 502 Indiana Avenue, Sheboygan, Wisconsin 53801.

Choose pits (round) or boxes (rectangular). Both available with cosmetic "ever-green" covers.

AMETEK

You don't have to cure something you have already prevented... 3336™ prevents 7 major diseases on tees, fairways and greens.

USE SYSTEMIC 3336 TO PREVENT ALL 7 MAJOR TURF DISEASES. 3336 CONTROLS AND PREVENTS SUCH DISEASES AS FUSARIUM ROSEUM, DOLLAR SPOT, RED THREAD, COPPER SPOT, HELMINTHOSPORIUM (LEAF SPOT), BROWN PATCH AND STRIPE SMUT.

There's no need to wait for the first signs of a disease to appear. That's the costly time to treat. With 3336 you'll need as little as one ounce per 1,000 sq. ft. This means you can cover large areas such as fairways and tees. . .and 3336 gives you up to 4 weeks control. On greens, weekly sprays during the disease incidence season has resulted in disease-free greens all season long.

Keep your turf out of the sick bed with a 3336 PREVENTION PROGRAM. You'll feel better too!

REMEMBER: Cleary's 3336 Turf Fungicide is non-phytotoxic, non-mercurial and systemic too.

Call your distributor today.

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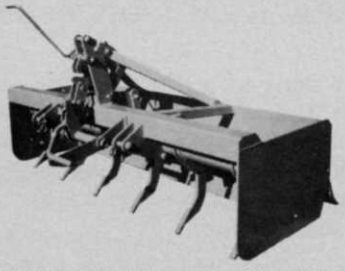
For More Details Circle (118) on Reply Card

These box scrapers mean business!

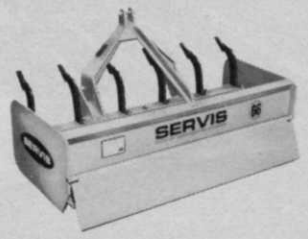
All ten models are built to move heavy loads quickly with minimum power and effort. Curved blades cut and roll soil into maximum loads. Lifting mechanism and scarifier assemblies are designed with higher front end clearance for larger intakes. The exclusive structural design of all Servis deluxe box scrapers provides direct support from the draw link connection to the rear moldboard to prevent warping or bending. See your dealer for the Servis box scraper that best fits your requirements . . . and make fast, easy work of all future soil moving jobs!

HYDRAULIC models (66", 72", and 84") feature a positive mechanical lock to eliminate any stress on the cylinder, even when scarifiers are cutting the toughest ground.



AUTOMATIC LIFT-TRIP models (66" and 72") feature scarifiers that automatically lift and lock when the box is raised. Trip lever drops teeth back into cutting position.

HAND-LIFT models (66", 72", and 84") have manually-operated hand-lift control which easily raises, locks, and disengages scarifier teeth. Highly responsive.



SECO, JR. models (66" and 72") are popular with operators who do not usually require scarifier teeth for their routine work. Optional teeth can be positioned manually in UP or DOWN position.

WT3

SERVIS **SERVIS EQUIPMENT COMPANY**
1000 Singleton Box 1590 Dallas, Texas 75221

Please send product literature on: ☐ HYDRAULIC SCRAPER ☐ LIFT-TRIP SCRAPER ☐ HAND-LIFT SCRAPER ☐ SECO, JR. SCRAPER

☐ Also, please send me the name of my nearest authorized SERVIS dealer.

Name _____ ☐ Student?

Address _____ Telephone _____

City _____ State _____ Zip _____

JAMES W. DAVIS

A new vice president and general manager for Toro's Irrigation Division has been named by Toro president, David T. McLaughlin.

He is James W. Adams, 43, who resigned his post of manager, industry systems requirements, in IBM's Data Processing Division to take over direction of the Toro facility at Riverside, Calif.

Adams succeeds Edwin J. Hunter, founder and president of Moist O'Matic, Inc., the irrigation equipment company that was acquired by Toro in 1962. Hunter, who holds more than 50 patents, was named Toro vice president for research and development last month.

Product Liability Film Available from Kaiser

A comprehensive presentation on product liability, produced initially as an audio-visual by Kaiser Aluminum & Chemical Corporation, is now being released as a 16mm color and sound film.

The 30-minute program, titled "Product Liability — Loss Prevention and Control," is available to other companies and schools at a nominal cost. More than 300 companies throughout the United States and in several foreign countries have currently used it.

The colorfully-illustrated program outlines steps that companies can take to acquaint employees with procedures to improve product reliability and reduce claims. These include: education to develop an awareness of the seriousness of the problem; new product safety review; establishment of risk criteria.

For additional information about this film, write Product Liability, Kaiser Aluminum & Chemical Corporation, 300 Lakeside Drive, KB 910, Oakland, California 94604.

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Here's proof when fertilizing a 5" tree

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(Example price throughout U.S.)

2 lbs./inch of trunk diameter = 10 lbs. × 4.5¢/lb.	$ .45
½ hr. labor @ $4/hr.	2.00
Labor and materials	$2.45

$2.45 ÷ 5" tree = 49¢/inch of diameter
No allowance made for depreciation, amortization, breakage of auger, mistakes, etc.

[1]*Using electric auger.*

Jobe's Tree Food Spikes Method[2]

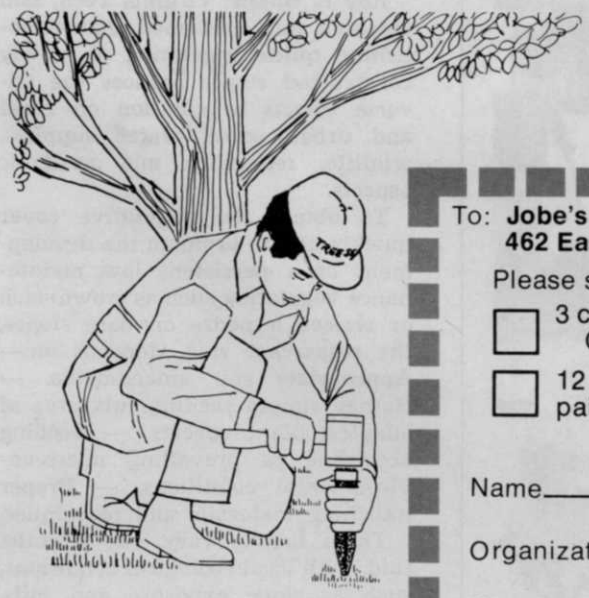
5 spikes 16-8-8 fertilizer—22¢/spike

1 spike/inch of trunk diameter	$1.10
5 min. labor @ $4/hr.	.33
Labor and materials	$1.43

$1.43 ÷ 5" tree = 29¢/inch of diameter, based on 20 case order.

[2]*Based on results of university field tests and recommendations.*

Professional tree and turf men using Jobe's Tree Food Spikes save 50% and more in labor and materials. Save time and money by using Jobe's Tree Food Spikes. Order from your local supplier or use the coupon below.



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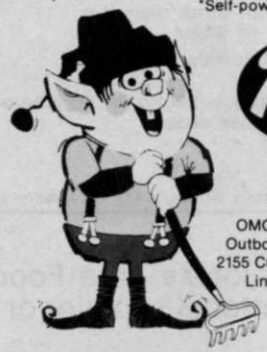

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Officers Are Named By Turfgrass Grounds

Two statewide associations affiliated with Maryland's sod industry have recently elected their 1974 slates of officers and directors, says Dr. John R. Hall extension turf management specialist at the University of Maryland.

They are the Maryland Turfgrass Council and the Maryland Turfgrass Association, Inc. Dr. Hall serves as secretary of both groups.

Re-elected as president of the Maryland Turfgrass Council at its second annual meeting was Angelo F. Cammarota, golf course superintendent at the Hobbits Glen Golf Course in Columbia. Emory R. Patton is the council's new vice-president.

G. Laurence Moore of Florence is the new president of the Maryland Turfgrass Association, Inc. The new vice-president is David C. Hamilton.

Two sod producers have been named directors on the board of the Maryland Turfgrass Association. They are Ralph L. Roberts of Laytonsville and Robert E. Hawkins of Germantown. The association's third new director is Dr. Harold H. Bryant of Brooklandville.

New Rights-of-Way Need Quick Green Growth

Establishing vegetation while grading operations for highway construction are under way can help to reduce environmental pollution from erosion.

Roy E. Blaser, Virginia Tech, said research has confirmed that establishing quick vegetation on newly constructed slopes reduces the adverse effects of siltation on rural and urban areas, water supplies, wildlife, recreation and aesthetic aspects.

To obtain the vegetative cover quickly and to promote the development of a persistent low maintenance vegetation such as crownvetch or sericea lespedza on bare slopes, the researcher said, depends on:— Appropriate soil amendments. — Rather simple seeding mixtures of adapted plant species. — Seeding according to prevailing micro-environmental conditions. — Proper mulching materials and techniques.

These factors vary, the scientist said, with local ecological conditions, such as slope exposure and soils. But the results of the research, conducted in West Virginia and Virginia, can be applied "broadly in other states," Blaser said.

Bill Johnson Uses Forklifts Equipped With Torque Converter

Bill Johnson, one of the nation's top sod growers with 1800 acres operating as the Halmich Sod Nursery, uses a six-cylinder, 63-horsepower White forklift at his East Lansing outlet. Downtime on the forklift, Bill says, has almost been eliminated. T torque converter on the forklift provides flexibility for clutching involved in the loading proces.

PRODUCTIVITY has become a key factor in success or failure for many sod producers. With the housing market slowing down substantially, growers are finding that every day land is not in sod, profits are lost.

On the brighter side, however, the Federal Housing Authority now requires sod on all Federal housing projects. This means a high degree of competition among sod growers. Again, productivity will become a key issue.

Sod producers in Michigan experiencing these events are coping with them in a variety of ways. Take the Halmich Sod Nursery in East Lansing, for example. It is one of the largest sod farms in the midwest. Actually, it's composed of three farms totaling about 1,800 acres.

During the growing season, Halmich will ship eight to ten flatbed truck loads of sod (1,800 yards) daily. Each truck carries sod packed securely on 10-14 wood pallets.

For Halmich, until the beginning of the growing season this year, moving pallets through muck beds to trucks and positioning pallets once on the trucks was a serious problem.

There was no problem securing the sod, because it could be cut and efficiently packed on pallets. But picking the pallets up and then moving them with a forklift to the flatbeds was apparently too much for most forklifts to handle over an extended period of time.

"Our season is short, and we direct sell," says Lyle Young, manager of the East Lansing, Halmich farm

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Manhattan perennial ryegrass was selected and developed by Dr. C. Reed Funk, Rutgers University. Manhattan develops a uniform dark green, leafy, dense turf with leaf blades finer than most Kentucky bluegrasses. Excellent for hard use areas such as tees, green aprons, cart path flare areas and hard use problem areas. Mowability ratings are excellent.

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Manhattan blends well with other grasses. Here it is combined with Bluegrass.

Manhattan is outstanding for hard use areas. Cartpath flare area reseeded with Manhattan perennial ryegrass.

It's Kid Proof!

Manhattan's fine texture is illustrated in this comparison.
Left: FINE LEAF FESCUE
Center: MANHATTAN PERENNIAL RYEGRASS
Right: KENTUCKY BLUE GRASS

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and 12-year veteran of the business. "Every yard of sod is cut to order. We can't afford the downtime of repairing forklifts or inefficiencies of forklifts that can't move through the beds."

One of the biggest problems on many Michigan sod farms is flotation of equipment — including forklifts — on the decomposed and decayed roots underlying the fertile, rich muck soil.

"When pallets are lifted and loaded on to flatbeds, a tremendous amount of clutching is required," adds Young. "There is slippage, particularly during the truck loading process, and without a torque converter, for example, a drive train might be lucky to last a month."

During the growing season, the pallet loading process might be in operation 10-12 hours a day or a total of 800 hours during a normal growing year. Without a forklift of the capacity and stability to get the job done, a sod farm might easily revert back to a swamp.

At the Halmich Sod Nursery, the answer was found in a two-wheel-drive, 63 horsepower forklift from Paty's, Inc., and built by Construction Equipment Division of White Motor Corporation. "It helps keep the nursery producing at capacity," said Young. "With a six-cylinder engine, we knew that the forklift was not under-powered and could be called upon to handle anything we might 'dig up' for it."

Bluegrass Insecticide Study Progress Report Presented

Insecticide use failed to stop development of brown seed heads in bluegrass seed fields during 1973 University of Idaho trials.

That was one of the findings in a preliminary progress report by Roland Portman, UI state entomologist who headed up the insecticide trials.

Insecticides used were Furadan, Dylox, Meta-Systox-R, Orthene, Dursban and Cygon. Two application rates were used—one half and one pound actual material in about 80 gallons of water per acre.

The first treatment was made April 18. A second set of plots was treated May 5.

Counts of brown seed heads, made June 12, revealed insecticide treatments failed to prevent brown seed heads. Sixteen of the 48 treated plots had more brown heads than did adjacent untreated field areas.

At this point, cause of the blank brown head condition in bluegrass seed fields is unknown.

The condition is characterized by a withered stem above the top node and a brown blank seed head. Brown seeds heads occur more often in fields of common bluegrass than in fields of patented bluegrass varieties.

Another condition, although not serious in Idaho but found in the state, can also reduce bluegrass seed yields.

It is silvertop, caused by grass bugs and grass thrips feeding.

Grass bug-caused silvertop is accompanied by a beak puncture through the seed stem sheath leaf into the seed stem. The stem above this feeding puncture is withered and distorted. The seed head is a silver color.

Grass thrips, found throughout Idaho, enter the upper sheath and feed on the developing spikelets while grass is in the boot stage. The pedicel and florets beyond the feeding injury turn silver or white. These florets are seedless.

The economics off silvertop injury has not yet been evaluated in Idaho.

Portman said that in an associated study dealing with insect and bluegrass seed production relationships, post-harvest burning of seed fields killed almost all insects. Surviving the burning were larvae of wireworms, sod webworms and some cutworms—all soil inhabitants.

Grass sod core samples collected in burned bluegrass seed fields from March until mid-April showed an absence of insects. Sample from the roadside showed ants, thrips, weevils, springtails, plant bugs, cutworms and leafhoppers were present.

Sweeping samples taken in mid-April showed that leafhoppers had moved back into the seed fields.

Grass Production Practices Urged To Reduce Pollution

Ensign called on plant breeders and seedsmen to look for grass varieties which have low burn requirements. "Hopefully, some may exist," he said.

Some growers are increasing width between drilled rows beyond 12-14 inches at seeding time. Under some conditions this may sustain seed yields in a short term rotation better than the closer spacing, the plant breeder stated. Thus, thatch build-up is not as rapid.

It was suggested growers burn residue from bluegrass seed fields during early August. Ensign reasoned that this is the time when residues are usually driest, combustion levels are high and the expected pollution index lowest. However, burning may have to be delayed if conditions are hazardous for nearby fields and forests.

Another reason for early burning is that resulting seed yields are higher than for late burning.

A University of Idaho plant breeder has suggested ways to reduce air pollution caused by burning fields in the production of grass seed.

Dr. R. D. Ensign told the Intermountain Grass Seed Growers in January that one way might be to burn fields every other year where grass varieties permit. He noted that some varieties "need burning more than others to sustain yields."

Short term bluegrass stands, those from four to five years old, may not need annual burning which is required to get rid of heavy thatch in older stands, he said.

New Chemical Promises Control Of Johnsongrass

showed that glyphosate leaves no soil residue. The research found that:

—To be most effective, glyphosate should be applied in mid-summer when Johnsongrass plants are fully mature. Temperature is a fairly critical factor; best results occur when spray applications are made in a temperature range of 60 to 80 degrees F.

Roundup has not been registered for use by EPA.

Agricultural research workers at two Middle Atlantic agricultural experiment stations have achieved still another calibration mark for zeroing in on an effective control program for Johnsongrass.

At the fourteenth national meeting of the Weed Science Society of America, Dr. James V. Parochetti, associate professor of agronomy at the University of Maryland, reported on promising results obtained in a 3-year study with glyphosate (Roundup), an experimental foliar systemic herbicide.

Studies were concentrated on the Eastern Shore areas of both Maryland and Virginia in cooperation with Dr. Gordon W. Burt, fellow agronomist at the University of Maryland, and Dr. H. P. Wilson, plant physiologist for the Eastern Shore branch of the Virginia Truck and Ornamentals Research Station at Painter, Va.

Results of the research effort

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Industry Spokesmen Discuss Pesticide Law

"The biggest problem we'll have in this industry is understanding and not implementing the new pesticide law."

That is the summary statement by Dr. Charles E. Rieck of the University of Kentucky at Lexington, Ky., highlighted in a presentation of the Federal Environmental Pesticide Control Act (FEPCA) of 1972 during the Southern Weed Science Society.

FEPCA, now known as the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), with amendments is scheduled for final Implementation in the fall of 1976. It is the Federal act that controls the handling, distribution, use and registration of pesticides and applicators, both commercial and private, that apply these agriculture chemicals.

James A. Sample, editor of WEEDS TREES AND TURF, explained that "as concerned professionals we must consider carefully the trade-offs available between environmental and human health, weed control and pesticide exposure and others. The choice of material by the applicator must be based on evaluation of the benefit to hazard, not solely on the basis of toxicity."

James A Sample (left), editor of WEEDS, TREES and TURF, discusses the Federal Environmental Pesticide Control Act of 1972 with Thomas A. Evans, and John Lenard, technical representatives for E. I. DuPont and Chemagro chemical companies, at the Southern Weed Science Society.

At the present time, the Federal government is attempting to establish a restricted chemical list of pesticides that are deemed "dangerous" solely on the basis of toxicity ratings. Some state regulations have gone beyond the Federal search and established restricted use lists—North Carolina, for example.

The restricted list, a consistent labelling section, applicator licensing and provisions for law enforcement are key measures in the FIFRA legislation. It is also the areas for some confusion by the various states represented at SWSS.

Industry spokesmen, Thomas M. Evans and John Lenard, technical representatives for E. I. DuPont and Chemagro chemical companies, respectively, presented views for North Carolina and Louisiana.

Evans noted that while most states will seemingly go along with the Federal standards others will move faster in the implementation. Such is the case for North Carolina. While the USDA will require applicators to be trained and licensed by 1976, the NC State law requires the same permission by October of 1974.

Lenard also noted that while many states will be and have set up numerous Pesticide Advisory Boards the manpower and budget requirements for licensing and enforcement will always be on the increase. In Louisiana, for example, the budget for 1977 is allocated for over $866,000 and a total of 44 employees. This compares to less than 10 employees in the state for 1974 and half the budget.

Sample pointed out that the initial phases of FIFRA will largely be voluntary. Particularly so in the training and preparation for licensing. But, Dr. Rieck pointed out that such voluntary provisions of the new law are actually few and that most parts are open to forced compliance.

"But, until we figure out how to economically enforce the law," said Dr. Rieck, "it will have to be a voluntary system. I have no doubt but what the Federal government will figure out how to do that, too."

Thus, Dr. Rieck urged the more than 1,000 weed scientists, extension personnel and agrichemicals representatives present at the SWSS meeting to carefully review the FIFRA law and gain a better understanding and while there is still time.

Chemical Composition of Trade Names Studied

A federal agency and a private firm in Philadelphia are cooperating in a research project to identify specific chemicals to which American workers are exposed.

The National Institute for Occupational Safety and Health (NIOSH) has contracted with Auerbach Associates, Inc. for a 20-month study of up to 40,000 trade name products made by some 5,000 manufacturers.

These trade name products were identified by NIOSH as part of its National Occupational Hazard Survey, a two-year study designed to collect information relating biological, physical and chemical exposures to workers in industry.

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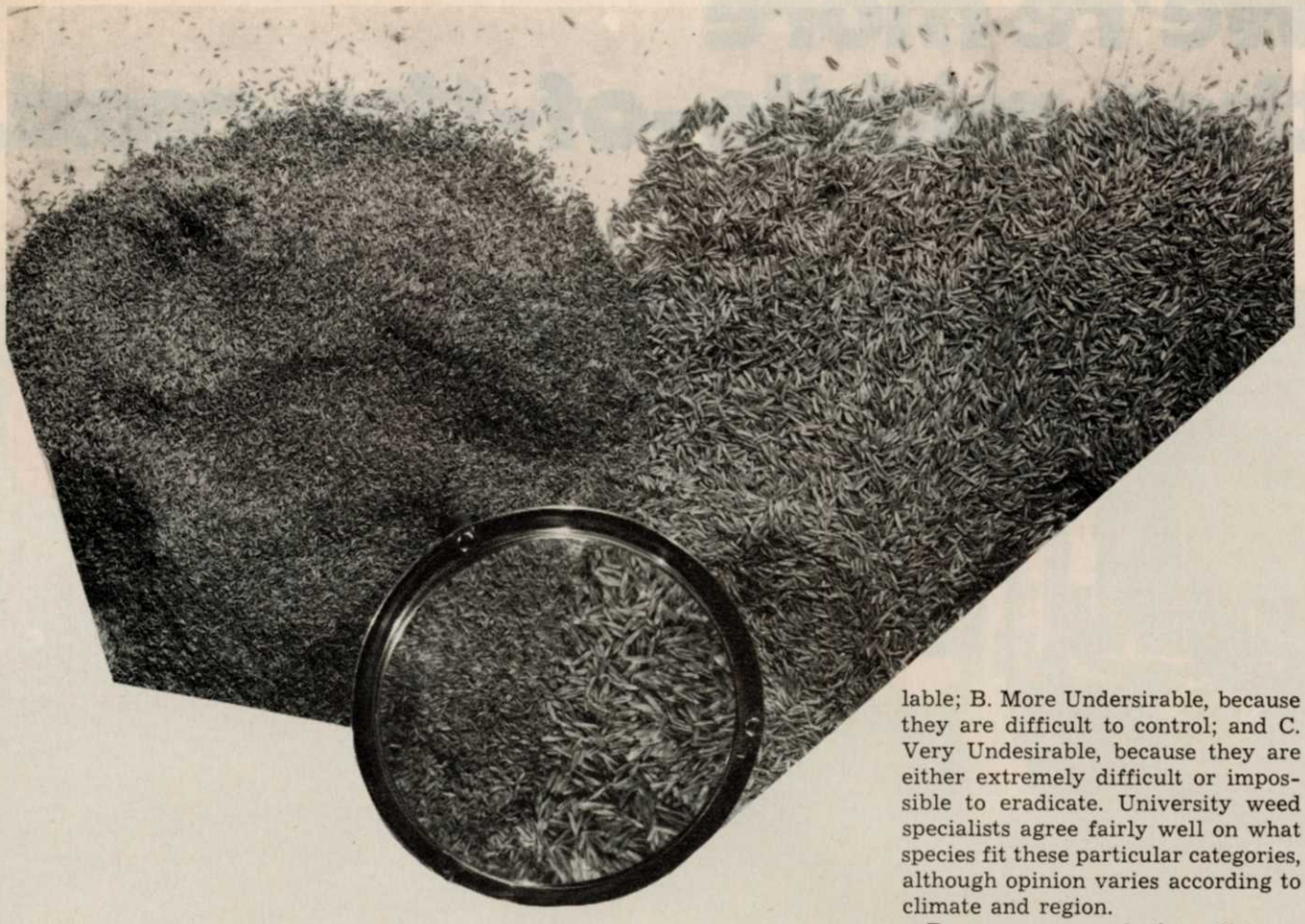

Turf Contaminants

By DALE E. KERN
Seed Technology

As a comercial seed testing laboratory, Seed Technology has been intimately involved in lawnseed testing, its specialty, for over two decades. We have accumulated records until they "run out of our ears" on what foreign seeds are contained in the bluegrasses, fine fescues, bentgrasses, and turf-type perennial ryegrasses. These seeds end up in a sod field, on golf courses, and in homeowner front yards wherever cool season grasses are planted in North America.

Some species are serious lawn pests, — but they may or may not be "weeds" by legal definition (oftentimes "crop" is far more "weedy" than are weeds). Others are of little consequence, because they are squeezed out of a turf by any well-adapted turfgrass. Still others make themselves quite a nuisance, but can be controlled inexpensively, and with rather little effort.

We don't hold things like dandelion and plantain to be too serious, even if they are among the most ubiquitous lawn weeds, because they are so easily eliminated selectively with inexpensive herbicides such as Trimec. A few are almost never carried in lawnseed (at least in the seed which is produced domestically), — rough bluegrass, Poa *trivialis*, for example. Poa *trivialis* can be a real hazard in a rainy year if it ever gets started in the sod (as Dr. Bob Newman reports for Wisconsin in 1973).

We are almost drowning in a sea of data (records accumulated from thousands upon thousands of official tests), but a logical way of pulling something together for the benefit of the sod grower, golf course superintendent, and the homeowner is not easy.

The first thing we must attempt is a rough assemblage of those species which are: A. Not too much of a problem, because they are controllable; B. More Undersirable, because they are difficult to control; and C. Very Undesirable, because they are either extremely difficult or impossible to eradicate. University weed specialists agree fairly well on what species fit these particular categories, although opinion varies according to climate and region.

Because some of the off-types seeds are found in a large percentage of the seed lots entering commerce, perhaps they should be considered more serious than others which show up only occasionally, and are represented by only a few seeds when they do occur. This is a rather unpleasant complication, for which we have no ready solution (say some mathematical formula for "seriousness," which might weigh both frequency of occurrence and abundance when found.).

Yet, one could equally well argue that even one seed of a Class C species is too much, even though seed lots containing it show up only rarely. There is really no alternative for a professional turf grower but to have each lot of seed that he is planting given a complete analysis for all contaminants. This service is, of course, the function of Seed Technology, and our commercial *raison detre*.

We maintain lists of contaminants likely to occur in various kinds of seeds produced in various regions. And we know the regions where the seed is offered and just which seeds are the cause for greatest concern. In a general way lets take a look at how the situation shapes up regionally, drawing upon the expertise of

(continued on page 78)

Six New BANVEL® Pre-Mix Combination Added To The BANVEL® Herbicide Line.

Banvel pre-mix combinations containing 2,4-D and 2,4,5-T are available in either oil or water soluble formations, lets you eliminate *selectively* tough brush, vines and broadleaf weeds that other herbicides often miss.

With this choice, the herbicide can be matched to type of vegetation, season, location, soil type, topography, environment, and other considerations. See your Velsicol representative or herbicide applicator for details.

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ECONOMY—Long-lasting BANVEL herbicide offers low cost. Often one application per season is all that is required for weed and vine control. Brush can be controlled for several growing seasons, with a 3- to 5-year root kill.

ECOLOGY—BANVEL has relatively short persistence in the soil. It has established tolerances for many food crops and milk. BANVEL is not harmful to animals eating foliage.

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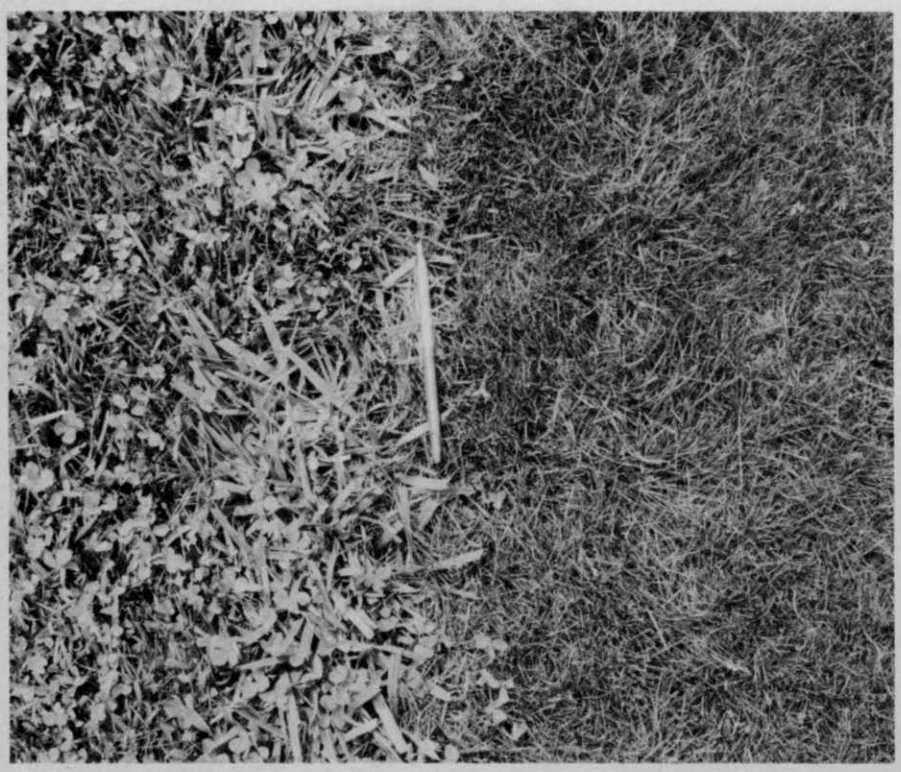

Look at the difference choice of seed can make. At above right, top quality seed free of undesirable inclusions has been sown. At left, a variety of troublesome weeds have appeared.

TURF CONTAMINANTS

(from page 76)

weed specialists at leading universities. (See Box)

CLASS A SPECIES — CONTROLLABLE

About thirty-five species seemed worthy of listing in this category, as being common or fairly common in commercial turf seed. We realize that a goodly number occur infrequently in certain kinds of seed, and may not even be a problem in some areas. Typical of this group of contaminants which compete poorly with turfgrass, or which are easily controlled with readily available herbicides are: Carpetweed *Mollugo verticillata,* chickweed *Stellaria media,* dandelion *Taraxacum officinale,* knotweed *Polygonum aviculare,* plantain *Plantago spp.,* purslane *Portulaca spp.,* Shepherd's purse *Capsella bursa-pastoris,* and several annual grasses.

CLASS B SPECIES — MORE UNDESIRABLE

Here are some of the weeds which are more persistent or have other objectionable features. Obviously there is no hard-and-fast separation from Class A species, and what may be a problem in one region may be a nuisance at most in another. Tenacious species such as white clover *Trifolium repens,* goosegrass *Eleusine indica,* puncturevine *Tribulus terrestris,* sandbur *Cenchrus spp.,* Canada thistle *Cirsium arvense,* and wild onions *Allium spp.,* are typical problem pests that are sometimes spread through lawnseed.

CLASS C SPECIES — VERY UNDESIRABLE

This group includes many of the perennial haygrass "crop" plants, and a few of the respected lawngrass species (such as volunteer *Agrostis spp.* if introduced where unwanted). Some, such as bermudagrass, may be serious in the border states, but not in more northerly states where it will winterkill. Most are Monocots not susceptible to selective elimination with familiar phenoxy formulations. Several are widely recognized agricultural weeds including nutsedge *Cyperus spp.,* quackgrass *Agropyron repens,* and familiar pasture perennials such as bromegrass, tall fescue, orchardgrass, redtop, and timothy. Perhaps a few dicots, such as speedwell *Veronica spp.,* should be included here rather than in Class B.

Here, in very brief review then, are what the pros tell us are the major lawn weeds and problems for their regions:

Northeast: In New Jersey, Dr. Engle observed that many familiar lawn weeds are a "problem," even though controllable, commonly from residual seed in the soil. Chickweed, cinquefoil, clover, crabgrass, dandelion, dock, goosegrass, ground ivy, heal all, horsenettle, knotweed, black medic, wild onion, oxalis, plantain, sheep's sorrel, sowthistle, spurge, violet, and yarrow are such nuisances, even if only Class A or B.

Bermudagrass can be a serious problem in middle Atlantic latitudes. So are cool season grasses such as annual bluegrass, bentgrass, tall fescue, nimblewill, orchardgrass, quackgrass, and velvetgrass. The sedges and speedwell might merit a Class C rating.

Dr. Skogley, in Rhode Island, feels there has been over-reaction about annual bluegrass and Canada bluegrass, which he considers infrequently serious in lawnseed. Dr. Jagschitz concurs that goosegrass is quite a problem, very difficult to control (particularly in "sensitive" turf such as bentgrass). But he has faith in modern measures for handling most of the above-cited weeds.

Dr. Troll, for Massachusetts, would add crabgrass, ground ivy, and oxalis to goosegrass, as the most serious lawn pests, — all typically adventive in the soil. He agrees that the coarse perennial grasses, as well as sedges

(continued on page 80)

Everyone In The Act . . . .

The Lawn Institute suggested sending our rough lists of contaminants to the University of Massachusetts, University of Massachusetts, University of Rhode Island, Cornell University, Pennsylvania State University, and Rutgers University for the Northeast; Ohio State University, Michigan State University, University of Wisconsin, University of Minnesota and Iowa State University for the upper Midwest Purdue University, and University of Illinois for the lower Midwest; Virginia Polytechnic Institute and the University of Missouri for the bor-der states Kansas State University, Oklahoma State University of Colorado for the Plains environment; and the University of California for the Far West. Bingham, Daniel, Engle Fults, Hodges, Jagschitz, Keen, Martin, Newman, Payne, Troll and Youngner, many of whom have consulted with other colleagues. We are especially grateful for their helpful comments, some of which are referred to in this review.

W. G. "Buck" Siler, who is pro and owner of Longview Golf Club, in the Guilford College section of Greensboro, N.C., says

"So far, this old Yazoo has saved me $28,000 in payroll"

"I bought it ten years ago; it replaced a 42″ belly-slung tractor.

"I was using two hand mowers trimming continuously during the season. After I got the Yazoo, we had one hand mower trimming two to three hours a week. I was able to save one man and put the other to work on spot seeding, repairing eroded spots, maintaining traps and manicuring the fringes of greens. The course looks a lot better because the work doesn't pile up.

"The trimming ability of this mower is remarkable. It can mow a 360-degree turn around the trees, without scoring the bark, as we did with the belly-slung mowers. We use it to trim 90% of the lake banks.

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Whn sowing a lawn, weeds like these (above) are certainly non-grata. Many come from residual seed in the soil. They can be rprssd whn good, weed free seed of modern cultivators is planted.

TURF CONTAMINANTS

(from page 78)

and speedwell, are especially injurious in the lawn and worthy of a C rating. Troll marks 26 of the controllable weeds (Classes A and B) of our talley as being introduced through lawnseed, at least occasionally.

Midwest and Border States: The situation in the upper midwest is not greatly different than in the northeast. Dr. Newman, Wisconsin, says that, unexpectedly, *Alopecurus aequalis* (a foxtail), a water-loving species, was quite a problem during 1973. *Poa trivialis,* also thriving on moisture, has been an even worse pest in sod. In Wisconsin most sod is grown on muck soil, where preemergence preventers don't work well.

Dr. Daniel, Indiana, lists the same coarse grasses and sedges as occur in the Northeast as being among the most pernicious, certainly Class C candidates. In the southern Midwest bermudagrass and even dallisgrass join the group (though neither survives in the northern Midwest). Nor does Daniel think kindly about Poa *annua.* Barnyardgrass, crabgrass, goosegrass, and *Setaria* foxtail are universal pests, controllable but troublesome.

In the border states lawn weeds become more diverse, and often harder to control (crabgrass, for example). Dr. Bingham says that in Virginia goosegrass, ground ivy and sandbur *Cenchrus* can be controlled, but not easily. He'd go along with Class C weeds troublesome farther north.

Plains States: In the prairie environment the weed cast changes, though irrigation brings in weeds typical of more humid climates. Dr. Keen, Kansas, finds clover, henbit, knotweed, and violet fairly troublesome, wild onion, very bothersome. On the other hand, bentgrasses are not much of a problem, nor most of the coarse perennial pasture grasses. It seems to add up to fewer Class C problems in Kansas.

In Colorado, Dr. Fults finds bentgrass, dandelion, tall fescue, orchardgrass, quickgrass, and spurge to be weeds of major importance. Though persistent, some of them are, of course, controllable, and then Class B rather than C. Some weeds causing difficulty in the east are of little or no importance, — dallisgrass, oxalis, wild onion, violet, even sedges and *Panicum* witchgrass. He notes that a lot of grama *Bouteloua* crops up in lawns in southern Colorado, a prairie species seldom encountered in the east. Surprisingly, puncturevine *Tribulus* is only slightly important, are as nimblewill and bermudagrass. Bromes, chickweed, clover, crabgrass, ryegrass, sandbur, yarrow and some of the other weeds rating Class C farther east are only "moderately important."

Far West: Dr. Youngner, California, seconds the nomination of difficult eastern pests (goosegrass and dallisgrass, for example), and adds a few notorious local examples as well: dichondra and pennywort *Hydrocotyle.*

Of course in California some of the "weed" grasses are also used as lawngrasses, — common bermuda and tall fescue. The eastern haygrass species such as orchardgrass and bromegrass are not serious in lawns in California. Velvetgrass is quite difficult, but not too commonly met with.

Prostrate spurge is vicious, as may be bur clover *Medicago hispida.* Occasionally *Poa trivialis* is noted as a contaminant in some seed lots. Fortunately, nimblewill is seldom met with. Kikuyugrass *Pennisetum clandestinum,* a tropical introduction, is nearly uncontrollable where it gets started, though hardly a lawnseed problem.□

European Epuip. Dealers See Mfg. Plant, Sod, Turf

Fifty-two European turf maintenance equipment dealers toured a sod farm, two high school athletic fields and the Ryan Equipment Company manufacturing plant in St. Paul, Minn.

The two-day field trip was hosted by Ryan officials in cooperation with Orag Inter Ltd. of Baden, Switzerland. Orag Inter Ltd., one of 19 Ryan distributors operating in Europe, arranges similar tours to the United States every two years for its dealers and their wives.

The visitors from France and Switzerland represented turf maintenance markets including landscaping, retail sales and golf course maintenance. The dealers were in greater St. Paul in mid-October. They were accompanied by James B. Briggs, group vice-president of non-marine products with Outboard Marine Corporation; Vaughn E. Border, director of marketing with OMC-Lincoln; Vern Worrel, general manager of Cushman and Ryan turf maintenance equipment; and Russell Rose, a district sales manager.

On the first day, dealers toured the Label Lawn sod farm in nearby Lake Elmo, Minn. Label Lawn covers more than 600 acres and is one of the largest sod farms in Minnesota. The dealers also visited athletic fields in neighboring White Bear Lake and Anoka, Minn. Both fields are undergoing a five-year experimental turf maintenance program co-sponsored by Ryan.

The educational trip ended with a visit to the Ryan manufacturing facility. The plant manufactures turf maintenance equipment and employs more than 100 persons.

Pocket-Size Slide Chart Developed By Toro

The Irrigation Division of the Toro Company has developed a handy pocket-size slide chart to help contractors design residential and commercial irrigation systems. Made of sturdy paperboard, it can be purchased for 40 cents from any Toro irrigation distributor.

The slide chart can be easily used to calculate friction loss in pounds per square inch/per hundred feet for the four most commonly used types of pipe: Class 200 p.v.c., polyethylene, Type K copper and galvanized steel; losses for water flow in pipe sizes of ½"-1¼" and up to 36 gallons per minute are shown on the slide chart.

A sliding scale also provides for direct reading of friction loss in ⅝", ¾" and 1" water meters with a water flow up to 50 gallons per minute.

It also has a scale to show the arc, radius or diameter, pressure at the base of the head, gallons per minute, recommended spacing, and the precipitation rate in inches per hour for 34 different models of Toro sprinklers.

A fixed scale shows friction loss for seven different models of Toro's Series 200 automatic valves.

Comparison Of Irrigation Methods Discussed

Putt on a bentgrass green when the grass is being watered and never get wet?

You bet, using a system discussed by Dr. Gordon V. Johnson, soil scientist in the University of Arizona.

He described three irrigation methods under comparison, sprinkler irrigation; sub-surface irrigation with a stable water table one foot below the putting surface; and sub-surface irrigation with a fluctuating water table. In the case of both sub-surface methods, a plastic sheet lies buried two feet below the surface and water is piped into the built-up green below its surface. Bentgrass was used in his tests.

"Like growing grass in a bathtub," described Johnson.

In the University of Arizona trials, Johnson said sub-surface irrigation using a fluctuating water table has panned out best. This method calls for filling the basin formed by the plastic tarp periodically to within two inches of the green surface. Then, when the grass roots have almost exhausted the supply of water, you refill it.

"We find the green needs refilling every two weeks during the summer months; about once each three months the winter season," he said.

With a stable water table held that way with an automaic float valve system, the scientist found it hinders nitrogen nutrition.

As well as disrupting golfers when the above ground sprinklers are turned on, the scientist said bentgrass needs cooling by watering 1 or 2 times daily during the hottest afternoons to keep it from wilting.

There was no color difference in the grass with any of the three irrigation systems so long as nitrogen fertilizer was applied directly on the putting surface.

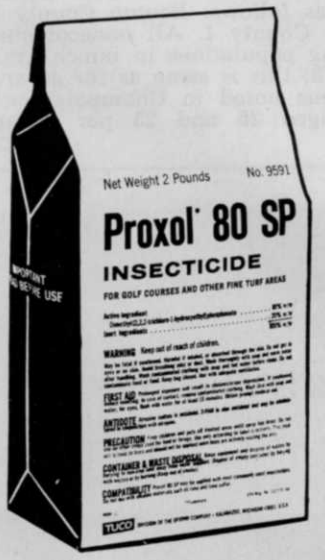
Earlier, he attempted to add nitrogen using the buried pipe system, but this resulted in a pale green putting surface.

"With sub-surface irrigation, there is less chance of losing bentgrass greens through drying," Johnson concluded.

Take the guesswork out of turf insect control

Diagnostic Aid from TUCO

Many turf insect larvae are night feeders, so the first evidence of their activity frequently is damaged turf. Diagnostic Aid, applied to turf as directed, causes insects to emerge to the surface within 10 minutes. They can be identified and counted to determine the level of infestation and whether an insecticide should be applied. It also can be used after insecticide application to measure the control obtained.



Proxol* 80 SP Insecticide from TUCO

Proxol is the one insecticide developed especially for use on fine turf and ornamentals. Sod webworms and cutworms are two major groups of turf insects controlled by Proxol. It is estimated that each sod webworm larva can chew up 20 square inches of turf in its average life span of 20 to 40 days; the cutworm larva can devour up to 36 square inches. With 300 to 500 larvae generated from each adult in a period of 10 to 21 days, it becomes apparent why early detection and control are desirable. Using Diagnostic Aid and Proxol together lets you program insect control.

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One bottle of Diagnostic Aid FREE in each case of Proxol 80 SP.

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—insect report—

INSECTS OF ORNAMENTALS

TORTRICID MOTH
(Platynota rostrana)

ALABAMA: Larvae observed leaf rolling and stem feeding on 5-10 percent of several hundred potted gloxinia in commercial greenhouse at Columbia, Houston County. This is a new county record.

SOFT SCALE
(Pulvinaria mesembryanthemi)

CALIFORNIA: Nymphs and adults infested *Mesembryanthemum* (ice plant) ground cover at Napa, Napa County. Scale increasing range and has unlimited host material as ice plant widely used on freeways plantings.

MEALYBUG
(Spilococcus cactearum)

OREGON: Light to very heavy on cactus plants *(Mammillaria* spp. and *Echinopsus* spp.) in 2 nurseries at Portland, Multnomah County. About 4,000 plants under hold order until infestation controlled. Infested material originated from 2 out-of-state nurseries. Recommended treatment ineffective, growers forced to hold material.

AZALEA LACE BUG
(Stephanitis pyrioides)

FLORIDA: All stages severe on leaves of 300 azalea plants at nursery in Apopka, Orange County.

HEMISPHERICAL SCALE
(Saissetia coffeae)

ALABAMA: Specimens collected from ferns at various locations during host plant survey. Taken from Morgan County greenhouse and in Purdue, Bibb County home. These are new county records.

TREE INSECTS

DOUGLAS FIR TUSSOCK MOTH
(Hemerocampa pseudotsugata)

OREGON: Egg mass surveys completed. Infestations expected to be economic in 1974 barring natural controls. Possible infested acreage, including area north of State line, estimated at about 600,000. About 121,000 acres of private timberlands expected to need treatment in 1974.

LINDEN LOOPER
(Erannis tiliaria)

WEST VIRGINIA: Seven male adults taken in blacklight trap in Dolly Sods area of Grant County. This is a new county record.

FALL WEBWORM
(Hyphantria cunea)

FLORIDA: Adults collected at blacklight trap in Belle Glade, Palm Beach County. First report of season.

TIGER MOTH
(Halisidota ingens)

NEW MEXICO: Small colony collected from young pinyon pine north of Silver City, Grant County. This is a new forest district and new county record. Light scattered larval infestations of this species and *Phenacaspis pinifoliae* (pine needle scale) caused light to moderate damage to pinyon pine on 20,000+ acres of private land near Las Vegas, San Miguel County. Many tents of *H. ingens* contain only dead first to third-instar larvae; fewer tents with hibernating fourth to sixth-instar larvae. Heaviest *P. pinifoliae* damage on pines bordering dusty roads.

NANTUCKET PINE TIP MOTH
(Rhyacionia frustrana)

TEXAS: Heavy on Christmas trees in Orange County. Infested about 75 percent of trees in one planting. Infested terminals ranged 1-3 per tree.

VARIABLE OAKLEAF CATERPILLAR
(Heterocampa manteo)

MARYLAND: Overwintering larval populations in Frederick City Watershed area north of Frederick, Frederick County, ranged 8-10 per square foot. Oaks in these 10-15 square miles 60-100 percent defoliated in 1973.

TURF INSECTS

FALL ARMYWORM
(Spodoptera frugiperda)

OKLAHOMA: Heavy in Bermuda grass lawns in Washita County. Scattered damage to Bermuda grass still reported in Comanche County. TENNESSEE: Continued to damage newly sodded and seeded grasses in all areas of State where no controls applied to infested areas. Larval activity decreased.

SOD WEBWORM
(Crambus trisectus)

MARYLAND: Continued to cause heavy damage in home and commercial turf in Montgomery, Baltimore, Prince Georges, and Howard Counties. Ranged up to 17 per square foot of sod. Treatments not giving adequate control.

SOD FLY
(Inopus rubriceps)

CALIFORNIA: Adults collected in Alameda County. This is a new county record. Indicates fly is spreading out of San Francisco peninsula where it has been known since 1948.

CINCH BUG
(Blissus leucopterus leucopterus)

INDIANA: Adults taken in only 6 of 23 sites during annual 1973 fall survey as follows: Benton County 2, Jay County 3, Blackford County 1. All noneconomic. ILLINOIS: Over-wintering populations in bunch grass samples very light in 1973; this is same as for several years. Heaviest populations noted in Champaign and Iroquois Counties; averaged 25 and 23 per square foot, respectively.

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Plants Have Nerves Says Cornell Biologist

What do plants and man have in common? A Cornell University biologist has determined that certain plant cells act much like human nerve cells in transmitting nerve-like signals from one point to another.

Stephen E. Williams has found that the sundew plant, a carnivorous plant which grows in bogs and other swampy spots, actually "feels" its prey before making the catch. When an insect is caught, it often rubs the tips of neighboring tentacles causing the tentacles to bend over and hold the prey against the leaf. Insects are then digested by enzymes, providing nourishment to the plant.

The question is, how does the base of the hairlike tentacle "know" when to bend over and pin the prey against the leaf if all that the insect touches is the tentacle tip? That question also puzzled Charles Darwin about 100 years ago. Williams' discovery of the nerve-like activity satisfies the question that raised Darwin's curiosity.

Williams explains that the tentacle tip is made of layers of highly sensitive cells that are capable of converting a mechanical or physical stimulus, such as touching, into electrical impulses much like nerve signals.

The message travels down to the base of the tentacle when the tip is touched, much the same way human nerve cells relay signals throughout the body in the form of electrical pulses.

Using very small electrodes, the plant physiologist was able to measure how fast the "nerve" signal travels through these cells. He found that the signal in the sundew travels as much as 10,000 times slower than in animal systems.

"This is the major difference between the nerve-like processes of sundew cells and those of nerve cells in animals," he notes.

It also was found that the direction of the signal can be reversed. When the base of the tentacle is stimulated artificially with an electric shock, the signal will travel toward the tip.

Discussing implications of his findings, Williams says that study of this group of plants could shed much light on the evolution of sense organs.

"It is remarkable that these plants are totally unrelated to animals and yet they have developed very similar sense organs completely independently," he notes.

From a practical standpoint, his work could serve as a valuable research tool in exploring the possibility of such a phenomenon in other types of plants — a research other types of plants.

Does the sundew, Venus'-flytrap, pitcher plants, and other types of carnivorous plants depend on meat diets for their survival?

"Not necessarily," Williams says.

In another Cornell study conducted some years ago, in the same laboratory by concidence, it was found that the sundew survived as long as eight years in complete isolation without receiving a single bite of "meat."

"But, with insect diet supplements, the plant usually does better," Williams points out. "It makes its own food by means of photosynthesis, but insects apparently furnish vital mineral nutrients."

In his "Insectivorous Plants" published in 1875, Darwin reported that any tiny piece of meat or egg white was handled by the sundew in the same way it digested insects.

"This is still true, but home gardeners tend to feed the plant too much," Williams says.

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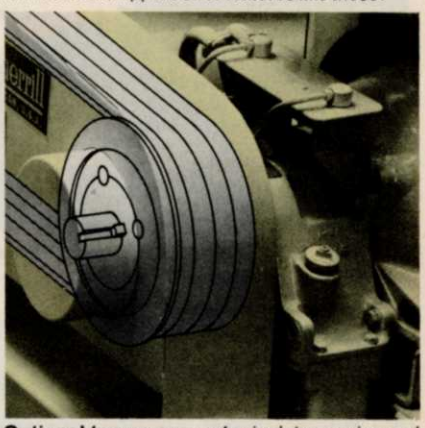

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Drip Irrigation Lessens Nitrate Runoff

Use of a different type of growing medium with trickle or drip irrigation systems may help solve an environmental pollution problem facing many nurserymen today—how to eliminate nitrate-laden runoff waters from their current operations.

Preliminary findings from research exploring this approach were reported by Dr. E. F. Wallihan, professor of soil science at the University of California, Riverside, during the American Society of Agronomy in Nov.

Sand-organic matter mixes are widely used by nurserymen as plant media because of desirable physical properties relating to bulk density, water release, aeration, and drainage. However, Dr. Wallihan noted, they have a low capacity for storing and delivering nutrients.

"To be certain that nutrient deficiencies do not occur," he explained, "nurserymen apply large amounts of fertilizers, most of which are carried into the soil beneath. A better plant medium and a better irrigation system are needed to limit this source of environmental pollution."

He reported that new materials are available to bind clay soil into tiny clods that should provide a better plant growth medium than the present nursery mixes.

"From this study," the UCR soil scientist said, "it appears that use of such aggregates would be just as satisfactory with respect to weight, water storage and release, aeration and drainage as current mixes. When used with drip or trickle irrigation systems, the aggregates would provide for better distribution of water within each container. This would reduce the amount of water required for irrigation and, thereby, the amount of fertilizer needed."

Dr. Wallihan said that extensive tests are now under way at UCR to learn how best to use the aggregate cultures.

N.Y. Arborists Elect

New officers of the N.Y. State Arborists Association were elected at the annual meeting in So. Fallsburg, N.Y.

They are: Carl Lundborg, vice president of F.A. Bartlett Tree Expert Co., president; D. W. Cadwallader, Hopewell Junction, N.Y., 1st vice president; James Taylor, Walden, N.Y., 2nd vice president; and Richard Wickey, Westbury, N.Y., 3rd vice president. George H. Callaway of Argyle, N.Y. continues as secretary-treasurer.

New board of directors includes: Jack A. Schultz, Merrick, N.Y.; Dave Kress, Schenectady, N.Y.; Ed Johnson, Hicksville, N.Y.; Jacob Bruinooge, Spring Valley; Sam Blakley, Mt. Vernon, N.Y.; Philip Brogan, Syracuse, N.Y.; David Williams, Clarence, N.Y.; Leo Cook, Vestal, N.Y.

Margaret Herbst was named executive secretary.

New Articulated Loader For Industry Market

New to the Green Industry is the multipurpose Bronco articulated loader, manufactured by Versatile Power Corporation, Grantsburg, Wisconsin. It is marketed by Conequip Sales, Inc. of Minneapolis, Minnesota.

Basically a hydrostatic true 4-wheel drive loader with articulated steering, the 3,400-lb. capacity Bronco is available with standard or heavy duty front ends and ¾ and 1 yard standard buckets.

The loader is powered by a 110 hp liquid cooled gasoline or a 93 hp. diesel engine through a 55 gpm hydrostatic pump and separate hydraulic motors coupled to each of the four wheels. There are no drive gears, belts, chains, shafts, differential or axles.

The front end oscillates for all-wheel contact on uneven terrain and

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Topdressing Supplier Opens New Plant

E. & S. Soil and Peat Industries, Inc. has opened their new plant, located near Rocky Mount, North Carolina, to supply sterilized soil mixes for topdressing and greens construction. Their standard mix conforms to the U. S. G. A. specifications, but they can also supply custom mixes.

Will W. Eason, Jr. is president of the newly formed organization and John W. Strickland is vice-president. Strickland is a member of the Mid-Atlantic Golf Course Superintendents Association and also the Golf Course Superintendents Association of America. He has had considerable experience in supplying this type of topdressing mix. He is the president of Egypt Farms, Inc. located in White Marsh, Maryland, and this firm has been supplying topdressing to the industry since 1968.

Accessories For Greensmaster Available From Toro

At its recent annual convention in Mexico City, Mexico, members of the Sprinkler Irrigation Association elected officers for 1974 and four individuals to serve two-year terms on the SIA board of directors.

President of the 375-member international organization is John H. Stevens, general manager of the Pierce Corporation of Eugene, Oregon. He succeeds M. L. Rawson of Ogden, Utah.

Vice President (president-elect) is Jim Pichon, owner of J. L. and Associates of Zephyr Cove, Nevada, a new firm distributing sprinkler irrigation equipment throughout the west. Treasurer of the Association is W. J. (Jack) Ogle, vice president for manufacturing of Gifford Hill and Company, Inc., Lubbock, Texas.

Board of directors are: Paul B. Bohley, The Gorman-Rupp Co., Mansfield, Ohio; Joe Harris, Lockwood Company, Lubbock, Texas; Taylor Ramsey, United Pipe and Supply Co., Eugene, Oregon; and Gary Underhill, Rain Bird Sprinkler Manufacturing Co., Glendora, California.

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For quick changes, there are up-front attachments: **mower heads** in 48" and 60" widths that accommodate a self-contained **vacuum pickup** with optional snorkel...and a giant 80" retractable batwing mower! Also, **snow thrower** and **blade.** Allied equipment includes rotary broom and rear-mounted tillage tools: plow, cultivator, and disc.

Hesston's Stump Cutter... makes stump removal a one-man job!

With one, simple operation the Stump Cutter cuts away stumps until there is nothing left but a neat 8" deep hole in the ground. Compact and lightweight, it goes into areas other stump removers can't handle. Now available with replaceable, bolt-on cutting wheel teeth!

The 1974 line includes Front Runner Model 200, with 19.8 hp; Model 180, 18 hp; and Model 160, with 16 hp. All attachments fit all models, so you can get the capabilities you need in the power size most efficient for your operation. Send for color literature that includes specifications on all three models.

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Lawn Equipment Division

FRSC-1-174C

8640 Brookville Road, Dept. B
Indianapolis, Indiana 46239

Please send me more information on the Hesston Front Runner GMT ____, the Hesston Stump Cutter ____, and the name of my nearest dealer.

NAME _____

COMPANY _____

ADDRESS _____

TOWN/STATE _____ ZIP _____

For More Details Circle (136) on Reply Card

Pesticide Shortages Studied By Industry

H. L. Straube, vice president of Stauffer Chemical Company has been named to head an industry committee to determine the seriousness of the shortages of pesticide chemicals and to help alleviate the most critical situations.

Under Straube's direction, the group will endeavor to determine the critical shortages of feedstocks, intermediate chemicals, and other materials needed to manufacture pesticides. The committee will work to alleviate such shortages to avert, if possible, a reduction of food supplies which could result from current shortages.

— classifieds —

When answering ads where box number only is given, please address as follows: Box number, c/o Weeds Trees and Turf, 9800 Detroit Ave., Cleveland, Ohio 44102.

Rates: All classifications 50¢ per word. Box number, $1. All classified ads must be received by Publisher the 10th of the month preceding publication date and be accompanied by cash or money order covering full payment.

HELP WANTED

SUPERINTENDENT OF MEMORIAL PARK A leading midwest cemetery organization desires the services of a high calibre person with capabilities and standards that will justify earnings of $15,000 to $18,000 per year. The position requires the ability to hire, supervise and train personnel in handling the interment service, maintenance of turf, nursery, buildings and fleet equipment and in land development. Proven ability necessary in labor supervision and relations with the public. Close communication with management will provide the support necessary for success. Send hand-written resume', in detail, of the above mentioned subjects that would indicate your practical experience. Box 114, Weeds, Trees & Turf, 9800 Detroit Ave., Cleveland, Ohio 44102.

GREAT OPPORTUNITY FOR THE MAN WHO LIKES TO BE HIS OWN BOSS!

National leader in tree service, operating from Maine to Florida, offers excellent opportunity in sales and management. Ability to work with public and personnel is important. Must be experienced in tree work or horticulture. Excellent starting salary, expenses and fringe benefits. Intensive training course and outstanding growth potential. Send resume of experience or educational background to:

WILLIAM ECKHARDT
BARTLETT TREE EXPERTS
2770 Summer Street, Stamford, Conn. 06905

HELP WANTED

Position available for mature individual, with past operational experience, interested in organizing, developing and operating an ornamental shade tree and lawn division for a large, established New England Pest Control company. As this new division grows, your promotional prospects and salary will grow, as we are an aggressive and expanding firm. Top management status will be given to the right person, with proven background in horticulture, entomology, agronomy or related fields. College degree desirable. All replies confidential.

Send resume to:
Box 116
Weeds, Trees and Turf
9800 Detroit Avenue
Cleveland, Ohio 44102

HELP WANTED: GROUNDSKEEPER. Position available immediately for grounds maintenance man for Unit School District No. 50. Includes five schools and athletic fields. Evidence of formal training and work experience in ornamental horticulture industry required. Salary negotiable. For further information contact Loren C. Lemmon, Superintendent of Schools, 1101 N. Jefferson, Harvard, Ill. 60033.

DISTRIBUTORS for D. J. Andrews, Inc. stump cutter teeth, pockets and bolts. Best wholesale and retail price in U.S.A. Add to this exclusive area, local advertising at our expense, etc., and you have our story. D. J. Andrews, Inc., 17 Silver St., Rochester, N.Y. 14611. Call 716 235-1230, or 716 436-1515.

SALESMAN-SUPERVISOR for Tree Department B. S. plus minimum 5 years experience. Hospitalization, vacation, pension, company car, salary plus commission. Heyser Landscaping, Inc., 400 N. Park Ave., Norristown, Pa. 19401.

SEEDS

SOD QUALITY Merion Seed for discriminating growers. Fylking, Delta, Park, Newport, Nugget, Adelphi, Cheri, Glade and Baron bluegrasses as well as fine fescues. Also Manhattan fine leaved rye grass. We will custom mix your specifications. Michigan State Seed Co., Div. of Vaughan-Jacklin Corp., Grand Ledge, Michigan 48837. Phone No. 517 627-2164.

POSITION WANTED

POSITION WANTED — Grounds Superintendent — Age 38, married. 16 years experience; golf course construction and maintenance; parks construction and maintenance; heavy experience in all phases of irrigation; will relocate U.S. or Canada. Box 117, Weeds, Trees & Turf, 9800 Detroit Ave., Cleveland, Ohio 44102.

GOLF/GROUNDS SUPERINTENDENT 12 years experience in estate and golf course management, experienced with equipment and its repair. Relocate western states. Resume on request. P.O. Box 44, Cloudcroft, New Mexico 88317 or Phone 505 682-2058.

EIGHT STUDENTS graduating end of March from two year course in Golf Course Maintenance. Are looking for seasonal or permanent positions, willing to locate anywhere. Please contact — Landscape Career Center, Anoka TEC, Box 191, Anoka, Minnesota 55303.

HORTICULTURIST-eighteen years of diversified managerial and sales experience, challenges welcomed. Reply Box 113, Weeds Trees and Turf, 9800 Detroit Ave., Cleveland, Ohio 44102.

FOR SALE

FOR SALE: Complete tree Service Company, located on West Coast, gross $200,000.00 per year. Year round work. New spray rig, 3-2 ton dump trucks, 3-4 wheel drive pickups, 2 winch trucks, 3 chippers. Several other pieces of equipment. Box 180, Weeds Trees & Turf, 9800 Detroit Avenue, Cleveland, Ohio 44102.

Kerr-McGee bags it!
NITROFORM®
organic nitrogen

The economical nitrogen that feeds for months because it has different release rates . . . like time-release cold capsules.

Turf and Horticultural Products, Synthetics Dept.
Wilmington, Delaware 19899
® Registered trademark of Hercules Incorporated. STH74-24A

HERCULES INCORPORATED

Bandini bags it!
NITROFORM®
organic nitrogen

The slow-release nitrogen for W.I.N.ning turf . . . because it has a high percentage of W.I.N. (water insoluble nitrogen). No danger of burning, either.

Turf and Horticultural Products, Synthetics Dept.
Wilmington, Delaware 19899
® Registered trademark of Hercules Incorporated. STH74-25A

HERCULES INCORPORATED

For More Details Circle (168) on Reply Card

For More Details Circle (169) on Reply Card

DOUBLE EDGE sod cutter blades. Will fit any Ryan sod cutter. Works like double edge razor blade. Cuts much more sod per blade. Made to bolt on both ways. $24.00 plus postage. New automatic sod loaders for direct loading to pallets, trucks or trailers. No workers needed on ground. Both products developed and designed by Hadfield. Write or call Glen Hadfield, 4643 Sherwood, Oxford, Michigan 48051. Phone 313 628-2000.

SOD BLADES for Ryan, Brouwer, Beck. 12" to 18" heavy duty—$15.95, 24"—$17.95. Cut-off blades 12", 15", 16", 18"—$6.00, 20", 24", 26"—$8.00. All prices F.O.B. factory. Please write for complete literature. Money back guarantee. R & R Products, 3334 E. Milber, Tuscon, Arizona 85714. Phone 602 889-3593.

CHAIN SAW CHAIN, bars, sprockets, sharpening equipment, saw parts and accessories. Save to 40%. Professional quality, fully guaranteed. World's largest mail order supplier of this equipment. Free catalog. Write Zip-Penn, Box 43073-A68, Middletown, Ky. 40243.

ESTABLISHED SOUTHEASTERN tree service company, complete equipment, bucket trucks, chippers, chipper trucks, stump machines, etc., year round work, excellent contracts. Box 118, Weeds, Trees and Turf, 9800 Detroit Ave., Cleveland, Ohio 44102.

RYAN 18" sod cutter, automatic cut off, $500. Ryan 24" with roll Ryder attachment, $1,300.00. 7 gang Roseman mowers, $950. 1964 IHC screw tractors, $2,600. 35' tandem flat bed, $1,300. Phone 414 326-5267.

ARPS stump cutter teeth, top quality and best price in U.S.A., D. J. Andrews, Inc., 17 Silver St., Rochester, New York 14611. Call 716 235-1230.

MISCELLANEOUS

PESTICIDE TEXT BOOK: Helps prepare for state certification. All answers fully explained. More than 500 pesticide applicator firms are already ahead of you! $7.50/copy. Write: Austin M. Frishman, 30 Miller Rd., Farmingdale, New York 11735.

"Good news, tree. The city has granted you reprieve from execution this afternoon."

USED EQUIPMENT

MOTT INTERSTATER MOWER. International model 2656 tractor with three 8 foot Mott flail mowers, hydro-static transmission, power steering, lights, roll bar, and seat belts. Like new, only 320 hours. Fantastic mowing machine, cuts 19 foot swath, 8 acres per hour, extremely maneuverable! $13,500. McGinty Bros., Inc., Long Grove Road, Long Grove, Ill., 60047. Phone 312 438-5161.

BRUSH CHIPPER — 1969 Mitts & Merrill, excellent condition, low engine hours, 12" cutting head, extra cutting knives. Price $2,550.00. One man Hodges stump cutter or grinder — 12 horsepower electric start, extra gutter teeth, one complete extra cutting head with cutter teeth, A1 condition. Price $1,350.00. Young's Tree Service, 1107 Jamaica Rd., Lancaster, Pa. 17602. Phone 717 393-6710.

BASKET TRUCK — 55 ft. working height, 1965 2 ton International truck propane engine, 1970 Reach-All boom, hydraulic outriggers, hydraulic controls top and bottom, safety features, hydraulic pruners and saw, cab guard, many extras, excellent condition, $11,700.00. Phone 515 842-5569.

NEAR NEW Jacobson F-10 7 gang S.P. mower, $7,950.00; 1970 Jacobson F-10 7 Gang S. P. mower, $4,950.00; Ryan 18" sod cutter with sulkey roller att., $1,850.00; Deluxe Rol. Pac 1 ton roller for sod, $1,250.00. Meyers Turf Farms, Inc., Stilwell, Kansas 66085. Phone 913 681-2667.

FOR SALE: Sprayers: used and new—Hydraulic and mist, all makes. Reconditioned pumps — Bean Royal 20, 35, and 55. Used Rotomist parts. Phone: Normandy 2-3507 or write: Ralph McFarland, 209 Pleasant Place, Ann Arbor, Michigan 48104.

FOR SALE: Sprayers: used and new; hydraulic and mist, all makes; Royal 20, 35, and 55 pumps. Used rotomist parts, big discount! Phone: 313 6655-338 or 313 662-3507. Write: Ralph McFarland, 209 Pleasant Place, Ann Arbor, Michigan 48103.

FOR SALE: Vermeer TS-44A Tree Spade, like new, available April 1, 1974, $6,500.00. Terrapin Hills Golf Estates, Box 429, Fort Payne, Alabama 35967.

1971 VERMEER LOG CHIPPER model 604, diesel engine, 600 hours, like new, $12,000.00. Bob's Tree Service, 5148 North Flora, Kansas City, Mo. 64118. Phone 816 454-2242.

WANTED — Used 6' Gill Spiker Seeder with seed box. Preferably in Ohio. Send price and condition to Jim Fox, R2, Fredericktown, Ohio 43019.

SKID-MOUNT SPRAYER, like new, 300 gallon, 12 horsepower B. S. engine, high pressure hose, electric reel, $1,095.00. Phone 612 929-1070; 854-3508.

WANTED: Brouwer sod harvester. Send particulars to: Thornton's Turf Nursery, R2, Box 72, Elgin, Illinois 60120.

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trimmings

MULCH, MULCH, MULCH your weeds . . . has been recognized as an effective form of weed control under certain conditions for some time. Scientists apparently always on the lookout for a discovery have been wondering what to do with the old test tubes which once contained the promise of fortune and fame. May wonders never cease. The cleaning lady has made a discovery. Glass makes an effective mulch and aids in weed control. Well almost. A permanent fiberglass product has been produced from borosilicate fibers, bonded with resin, that permits moisture, air, and nutrients to enter the soil, but eliminates the emergence of weeds and grasses. The material will not rot, corrode or burn. It may be taken up and reused. Also, moisture evaporation is said to be reduced. Only the imagination limits where it could be used.

GRASS—A FAMILY FRIEND will probably play a more important role this year than ever before. The energy situation has forced families to stay home. And because the television offerings are becoming more limited, families will probably use outdoor living to a fuller degree. Just think of all the fun you can have on turfgrass lawn of Fylking, says Doyle Jacklin of Jacklin Seed. Football, badminton, softball, golf, even tag. Properly cared for turf will easily take these contact sports and more. And grass is one of nature's most prolific air conditioners as well as oxygen producers. Might not be a bad idea to encourage your customers to stay home more often.

SPRAY WITH A HEAD or foam is being considered a strong candidate in Ohio tests for the control of plant disease. Foam application of fungicides have shown promise in providing even greater protection to the environment than conventional sprays. Advantages include deposition of a greater proportion of the fungicide on plant leaves, uniform suspension of the material and treatment on days when wind prevent spraying by conventional methods.

DIAL-AN-ANSWER has a new number, says O.M. Scott & Sons, Marysville, Ohio. The current toll free number for answers on lawn care problems are: 800-762-4010 in Ohio; 800-543-0091 in Arizona, California, Colorado, Idaho, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah Washington, Wyoming; an 800-543-1415 in all other states.

WOLF WOODS fools Mother Nature. That's what the Philadelphia Zoological Garden did. They have constructed a "wild" environment to help increase the population of two threatened species: North American timber wolves and South American maned wolves. The zoo actually improved on nature. Wolf Woods has an underground irrigation system to supplement rainfall to support a forest of transplanted trees and other vegetation. "We think Mother Nature would approve," says Charles Rogers, staff horticulturist. The irrigation system is Toro, designed by Jerry Purcell of Philadelphia Toro. It features automatic pop-up, pop-down heads. Trees include Douglas fir, white pine, locust, clump birch and dogwood. More than 20,000 square feet of sod was installed.

SOD GROWERS BEWARE! The common problem of vandalism experienced regularly by farmers and growers can also touch sod growers in a big way, too. Scattered reports of sod damage in Ohio, Maryland and New Jersey prompts action on the part of sod growers to keep their eyes open. Generally what happens is car tracks and litter—the awesome reminder of a previous night's party. Yet authorities also have reports of damaged irrigation systems, thefts of equipment, etc. It's a good idea to post your farm with "Keep Out" and "No Trespassing" signs. It won't stop the determined vandal, however.

WILL TRAVEL NO GAS may well become even more pronounced before the energy situation is cured. The Connecticut Tree Protective Association has come to the rescue of its members in a unique sort of way. They've posted the phone numbers of the executive directors of the various county offices of the USDA Agricultural Stabilization and Conservation Service (ASCS) for those engaged in tree service and other agricultural activities. This way members who need fuel oil, diesel fuel, etc. have a direct contact with those who can provide positive action. They have also provided members with other sources of information on fuel emergency.

NEED TO KEEP LABOR busier while on the job? It's true. Some labor crews just don't have enough work to keep them occupied. Lightning Protection Institute, 122 West Washington, Ave., Madison, Wis., 53703, suggests selling a lightning property. If it is a tree job, a little you discuss work to be done on the property. It it is a tree job, a little more time spent in the tree by the climber can pay a handsome dividend later.

IS HORTICULTURE considered agriculture? Yes, says a Washington spokesman. By definition, "agricultural production means the commercial farming, dairy, poultry, livestock, horticulture, forestry and fishing activities, and services directly related to the planting, cultivation, harvesting, processing and distribution of fiber, timber, tobacco, and food intended for human consumption and animal feed." All this means that nurserymen are now authorized 100 percent of their current needs for gasoline and probably will be allocated 110 percent of their needs for middle distillate during the 1972 base period.

NO NET GAIN. That's what EPA Administrator Russell E. Train says about removing the emission control systems from autos. "It is EPA's technical judgment that a mass program to remove or modify emission controls on existing cars would result in no net gain, and possible even some deterioration, in nationwide fuel economy," he says. "The only certain result of such a program would be a major increase in motor vehicle emissions."

Oseco Limited has announced that construction has started on an expansion of the company's office, warehouse, laboratory and processing complex.

The expansion, which will cost $125,000, will double the capacity of the bagged-seed section of the warehouse, according to production manager Helmut Koops.

The head-office complex currently occupies about 45,000 square feet on 50 acres of land.

Oseco's products includes turf grass seeds for professional growers and retail markets, packaged flower and vegetable seeds, and forage and hybrid corn seeds.

The company ships seed to all parts of Canada and the United States, and exports grass and legume seed, including seed grown under contract in North America, to clients in Europe, Japan, Australia, Africa and South America.

For More Details On Back Cover Circle (149) On Reply Card

Look at it this way

Before selecting an automatic irrigation system, consider the viewpoint of a blade of grass. It wants to see enough water coming its way often enough to keep it healthy. How much and how often depends on such variables as growing conditions, sun and shade, height, temperature, and course contour. That's why the happiest sight a blade of grass can see is a member of Rain Bird's exclusive Golf Team (six full time golf irrigation experts) consulting with a Rain Bird installer and the superintendent—right on the course. It means the best irrigation plan, tailored to your course, carried out with the most reliable equipment. Ask anyone with a Rain Bird system. Ask any blade of grass.

RAIN BIRD®
Glendora, California 91740

For more information circle number 177 on card

"We'll use Baron on every acre of sod we grow this year."

In 1973, Tuckahoe Turf Farms Inc.,* Tuckahoe, N.J., tried Baron on several fields. Like we've said before, sometimes it's better to hear it from someone else. Here is what Walter Betts had to say...

"Probably the thing I like best about Baron is the way it comes up fast. I can plant Baron late in the season and still harvest sooner."

baron KENTUCKY BLUEGRASS

U.S. Dwarf Variety Plant Patent No. 3186

"I have compared Baron to Merion and found that Baron requires less fertilizer and was less sensitive to a dry spell just after planting. Let's face it. . .less water and less fertilizer means more money for me."

"I look for a grass that is as disease-resistant as I can find. I couldn't find a patch of rust or dollar spot. Looks like it resists other diseases too."

"Some grasses just don't take to the shock of mowing. Baron has what I call 'mowability qualities.' It withstands short mowing and the dark green color doesn't fade."

"What we need is a good tight root system that holds together from the field to the job. Baron lets us be a little less fussy when we're loading. It's tough."

"And Baron is extremely compatible in mixtures. As I said before, Baron will be used in all Tuckahoe Turf Farms mixtures this year."

There's not much more we can add to Walt's comments except that Lofts Pedigreed Seed Company or any authorized distributor is nearby wherever you grow sod.

LOFTS

Exclusive North American Grower and Distributor:

Lofts Pedigreed Seed, Inc.

Bound Brook, N.J. 08805 / (201) 356-8700

*Tuckahoe Turf Farms, Inc., growers of 500 acres of cultivated sod, supplies a good percentage of South Jersey's sod needs. Tuckahoe Turf Farms should not be confused with Tuckahoe Sod Farm of Rhode Island.

GOLF COURSE BUILDERS OF AMERICA
MEMBER